

TREASURY DEPARTMENT
UNITED STATES COAST GUARD

GENERAL RULES AND REGULATIONS
FOR
VESSEL INSPECTION

Ocean and Coastwise

(Title 46, C. F. R., Parts 59 to 65, Inclusive)



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The "General Rules and Regulations for Vessel Inspection, Ocean and Coastwise" are applicable to merchant vessels subject to title 52 of the Revised Statutes of the United States (secs 4399 to 4500, inclusive) and acts amendatory thereof or supplementary thereto

This publication replaces the "General Rules and Regulations for Vessel Inspection, Ocean and Coastwise," dated May 1, 1947, and includes all amendments published in the Federal Register to September 1, 1948. The rules and regulations covering boilers, pressure vessels, and appurtenances (which include castings, piping, valves, mountings, fittings, etc , and the design, construction, installation, and inspection thereof) are contained in a separate publication entitled, "Marine Engineering Regulations and Material Specifications." The rules and regulations relative to the examinations for and the issuing of licenses, certificates, raising of grade, etc , and other matters relative to merchant marine personnel are contained in a separate publication entitled, "Rules and Regulations for Licensing and Certifying of Merchant Marine Personnel." The rules and regulations governing tank vessels and tank barges are contained in a separate publication entitled, "Tank Vessel Regulations."

General authority over and responsibility for the administration and enforcement of the laws and regulations governing navigation and inspection of merchant marine vessels in the several Coast Guard Districts are vested in and imposed upon the Coast Guard District Commanders in charge of such districts.

Shipowners, operators, builders, vessels' operating forces, and other persons affected by the navigation and inspection laws and regulations should familiarize themselves with the provisions contained herein. To this end, Coast Guard personnel concerned with the administration and enforcement of these laws and regulations will extend every possible assistance.



J F FARLEY,
*Admiral, United States Coast Guard,
Commandant*

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TITLE 46—SHIPPING

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SUBCHAPTER G—OCEAN AND COASTWISE; GENERAL RULES AND REGULATIONS

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Section 59 01 Definition of terms. Certain terms used in the regulations in this subchapter are defined as follows

(a) **Commandant** This term means Commandant of the Coast Guard

(b) **Coast Guard District Commander.** This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspections, enforcement, and administration of Title 52, R. S., and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(c) **Officer in Charge, Marine Inspection** This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection district for the performance of duties with respect to the inspections, enforcement, and administration of Title 52, R. S., and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(d) **Marine Inspector or Inspector** These terms mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an

Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspections, enforcement, and the administration of Title 52, R. S., and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(e) **Headquarters.** This term means the Office of the Commandant, Washington, D. C.

59.1 Ocean steamers Under this designation shall be included all steam vessels navigating the waters of any ocean or the Gulf of Mexico more than 20 nautical miles offshore. For the purpose of apportioning lifeboat, life-raft, and davit equipment upon ocean steam vessels subject to the jurisdiction of the Coast Guard, they shall be divided into the following classes

(a) Passenger steam vessels

(b) Passenger steam vessels the keels of which are laid after July 1, 1915

(c) Cargo steam vessels and all other steam vessels navigating the waters of any ocean, unless hereinafter provided for

59.2 Davits required Vessels of classes (a) and (b) shall be equipped with davits in accordance with the following table

Registered length of ship in feet	Minimum number of sets of davits	Minimum number of open boats of the first class	Minimum capacity of lifeboats
			<i>Cubic feet</i>
100 and less than 120	2	2	980
120 and less than 140	2	2	1,220
140 and less than 160	2	2	1,550
160 and less than 175	3	3	1,880
175 and less than 190	3	3	2,290
190 and less than 205	4	4	2,740
205 and less than 220	4	4	3,230
220 and less than 235	5	4	3,800
235 and less than 245	5	4	4,500
245 and less than 255	6	5	5,100
255 and less than 270	6	5	5,610
270 and less than 285	7	5	6,190
285 and less than 300	7	5	6,830
300 and less than 315	8	6	7,550
315 and less than 330	8	6	8,280
330 and less than 345	9	7	9,000
345 and less than 370	9	7	9,850
370 and less than 390	10	7	10,700
390 and less than 410	10	7	11,600
410 and less than 435	12	9	12,580
435 and less than 460	12	9	14,430
460 and less than 490	14	10	15,920
490 and less than 520	14	10	17,810
520 and less than 550	16	12	18,720
550 and less than 580	16	12	20,850
580 and less than 610	18	13	21,900
610 and less than 640	18	13	23,700
640 and less than 670	20	14	25,850
670 and less than 700	20	14	27,050
700 and less than 730	22	15	28,560
730 and less than 760	22	15	30,180
760 and less than 790	24	17	32,100
790 and less than 820	24	17	34,350
820 and less than 845	26	18	36,450
845 and less than 880	26	18	38,750
880 and less than 925	28	19	41,000
925 and less than 960	28	19	43,880
960 and less than 995	30	20	46,850
995 and less than 1,030	30	20	48,750

The minimum number of sets of davits is fixed in relation to the length of the vessel. *Provided*, That a number of sets of davits greater than the number of boats necessary for the accommodation of all the persons on board may not be required

59.3 Strength and operation of davits (a) The davits shall be of such strength that the boats can be lowered with their full complement of persons and equipment, the vessel being assumed to have a list of 15°

(b) The davits shall be fitted with a gear of sufficient power to insure that the boat can be turned out against the maximum list under which the lowering of the boats is possible on the vessel in question

(c) The Commandant is authorized by the Seamen's Act (sec 14, 38 Stat 1178, 1181, 46 U S C 481) and Executive Order No 9083 (7 F R 1609) in specific cases to exempt existing vessels from the requirements of this section that the davits shall be of such strength and shall be fitted with a gear of sufficient power to insure that the boats can be lowered with their full complement of persons and equipment, the vessel being assumed to have a list of 15°, where their strict application would not be practicable or reasonable

(d) Each set of davits shall have a boat of the first class attached to it, provided that the number of open boats of the first class attached to davits shall not be less than the minimum number fixed by the preceding table

(e) If it is neither practicable nor reasonable to place on a vessel the minimum number of sets of davits required, a smaller number of sets of davits may be fitted, provided always that this number shall never be less than the minimum number of open boats of the first class required by the table. If a large proportion of the persons on board is accommodated in boats whose length is greater than 50 feet, a further reduction in the number of sets of davits may be allowed exceptionally, if the arrangements are in all respects satisfactory. *Provided, however,* That in all cases in which a reduction in the minimum number of sets of davits or other equivalent appliances required by the rules is allowed, the owner of the vessel in question shall be required to prove, by a test made in the presence of an inspector, that all the boats can be efficiently launched in a minimum time. The conditions of this test shall be as follows

(1) The vessel is to be upright and in smooth water

(2) The time is the time required from the beginning of the removal of the boat covers, or any other operation necessary to prepare the boats for lowering, until the last boat or pontoon raft is afloat

(3) The number of men employed in the whole operation shall not exceed the total number of boat hands that will be carried on the vessel under normal service conditions

(4) Each boat when being lowered shall have on board at least two men and its full equipment as required by this part and Part 60

(5) The time allowed for this test shall not exceed 10 minutes

(f) Vessels of class (c) shall be equipped with davits or other practicable means for properly launching the lifeboats. Mechanical davits, when installed on vessels of class (c), shall be subject to all the tests required by this section

(g) No type or make of mechanical or gravity davit shall be used unless it has first been approved by the Commandant

(h) No mechanical davits of a character which require manual or other power to turn the boats out to the position for lowering into the water shall be fitted on any vessel the keel of which is laid after September 1, 1941, if such davits are to handle a lifeboat which, without its complement of persons on board, but having on board all air tanks and other lifeboat equipment, exceeds 5,000 pounds total weight, i. e. 2,500 pounds for a single davit arm. An exemption to this requirement may be granted during the period of the national emergency, proclaimed by the President on May 27, 1941, if evidence is presented to the Commandant to substantiate a claim that compliance with this requirement would materially delay the completion and delivery of the vessel

(i) Davits of an approved type, which are capable of swinging the boats into the lowering position without the application of any effort or external force other than that necessary to operate the releasing mechanism, allowing the boat to move from the stowed position to the lowering position by the force of gravity, shall be provided to handle all lifeboats

the total weight of which, including air tanks and lifeboat equipment, but without the complement of persons on board, exceeds 5,000 pounds

(j) Where steel castings are used for davit frames or davit arms this material shall be fully annealed and comply with the following requirements

(In substantial agreement with A S T M Spec A-27-42 and A-215-41)

Tensile strength minimum psi.....	66,000
Yield point minimum psi.....	33,000
Elongation in 2 inches minimum percent.....	22
Reduction of area minimum percent.....	33

(k) Chemical composition for castings not intended to be fusion welded

(In substantial agreement with A S T M Spec A-27-42)

Manganese maximum percent.....	1 00
Phosphorus maximum percent.....	05
Sulphur maximum percent.....	06

(l) Chemical composition of castings intended to be fabricated by fusion welding

(In substantial agreement with A S T M Spec A-215-41)

Carbon maximum percent.....	0 30
Manganese maximum percent.....	70
Phosphorus maximum percent.....	05
Sulphur maximum percent.....	06
Silicon maximum percent.....	50

For each reduction of 0 01 percent below the maximum specified carbon content, an increase of 0 04 percent manganese above the specified maximum will be permitted up to a maximum of 1 00 percent

(m) Where structural steel is used for the fabrication of davit frames or davit arms the material shall conform to the following requirements

(In substantial agreement with A S T M Spec A-131-39 and A-7-42)

Tensile strength psi.....	60,000 to 72,000
Yield point minimum psi.....	0 5 T S
Elongation in 8 inches minimum percent.....	1,500,000
Elongation in 2 inches minimum percent.....	Ten Str 22

(n) Where welding is employed in the construction of davits, the welders shall be qualified by the Coast Guard

(o) All moving parts of davits shall be provided with bushings of nonferrous metal, roller or ball bearings properly lubricated

(p) An inspector shall be present at the foundry where castings are made to witness the tensile and bend tests prescribed. The manufacturer shall furnish an affidavit stating that the required tests for annealing have been made. When the inspector has satisfied himself that such castings comply with the requirements, he shall stamp the davit arm and frame with the letters U S C G, the initials of his name and the letters F T, and date of inspection

(q) Each davit and frame shall be tested for strength and operation at the place of manufacture in the presence of an inspector

(r) All mechanical and gravity davit arms or frames shall be tested at the extreme outboard position by suspending from the eye or end of each davit arm a weight equal to

the weight of the fully loaded and equipped boat (including full complement of persons at 165 pounds each) for which the davit is to be approved, plus 10 percent. Under this test, a davit arm or frame shall show no permanent set or undue deflection. While this test is being conducted, the frame and arms, if of cast material, shall be subjected to a test by being hammered to satisfy the inspector that the castings are sound and without flaw.

(s) While this test load is suspended, the operating gear of mechanical davits shall be tested by being operated from inboard to the extreme outboard position with the same operating crank or device used in actual practice aboard ship.

(t) The manufacturer shall affix to the davit arm and frame a heavy plate giving the name of manufacturer, date of inspection, serial number, capacity load, space for the inspector's initials, and the letters U S C G. After the inspector has satisfied himself that the assembled installation meets the requirements, he shall stamp the manufacturer's plates with his initials. Each set of davits shall be marked with identical serial numbers by the manufacturer.

(u) No davit arm or frame comprising mechanical or gravity davits shall be placed on board any vessel until all of the requirements of the rules of this section have been fully complied with. Whenever mechanical or gravity davits or parts of davits, such as davit arms, or frames, are installed on vessels, to take the place of davits, davit arms, or frames which have become damaged or broken, such davits or frames shall have the manufacturer's name plate affixed thereto.

59 3a Mechanical means for lowering (a) On all passenger vessels where the height of a boat deck exceeds 20 feet from the lightest seagoing draft, wire falls and mechanical means for lowering shall be provided for each set of davits.

(b) Winches, proposed for use in new installations, shall be of approved type and those which are contracted for on or after January 1, 1942 shall, in addition to conforming to the following requirements, be subjected to the shop test with a 100 percent overload and opened up for examination prior to the Commandant's approval.

(c) Plans and detail specifications of all lifeboat winches shall be submitted by the manufacturer to the Commandant for type approval. The plans shall show dimensions of all parts and complete bill of material used in the construction of the winches. Where welding is employed in the construction of lifeboat winches the welders shall be qualified by the Coast Guard.

(d) Inspection openings shall be provided in the winch housing or the housing shall be so arranged to permit examination. Screws, bolts, nuts, pins, etc., used in the internal and brake assemblies, shall be fitted with lock washers, cotter pins, or suitable backing stops.

(e) Worm gears, spur gears, or a combination of both may be used in the construction of the lifeboat winches. All gears shall be machine cut and constructed of steel, bronze, or other suitable materials. The use of cast iron for gears is not permitted. Gears shall be press-fitted on the shaft, and keys shall be properly fitted and secured.

(f) Motor clutches, when used, shall be of either frictional or positive engaging type. When one motor is used for two winches, the clutch shall be so arranged that only one winch shall be engaged at any one time. The clutch operating lever shall be capable of remaining in any position when subject to vibration, and shall be so arranged that when in neutral position both lifeboats may be lowered simultaneously.

(g) Winch drums for gravity davits shall be designed with grooves so that not more than one layer of the falls winds on the drum. Drums shall be so arranged as to keep the falls separated. The design shall also provide that the falls will be paid-out at the same rate.

(h) Winch drums for mechanical davits shall be designed with a minimum diameter of 16 times the diameter of the falls.

(i) All drums shall be properly flanged and the falls securely fastened. The use of connecting devices between the drums shall not be permitted unless bolted locking mechanism is provided.

(j) Each winch shall be provided with two brakes, one of which shall be a hand brake, the other a governor brake to automatically control the lowering speed of the lifeboat. The hand brake shall be arranged with a lever and counterweight so that when the lever is raised the brake is released and when the lever is lowered the counterweight will set the brake. The governor brake shall be designed so as to insure that the maximum rate of lowering consistent with safety is not exceeded, this, in general, shall not exceed one hundred feet per minute. External brake bands shall be made of corrosive resistant metal suitably lined. Internal brakes may be of the metallic shoe type. The brake drums shall be of steel.

(k) Bearings, gears, and other working parts shall be designed for and provided with positive means of lubrication. Worm gears shall operate in an oil bath. Means shall be provided so that the oil level in the gear casings may be checked. Manufacturers shall furnish a lubrication chart for each type of winch.

(l) Winches shall be designed so that they will operate by gravity when lowering. When vessels are fitted with nested lifeboats, special arrangements shall be provided to prevent boat falls from fouling on the drum when they are being recovered and means shall be provided for quick recovery of the falls by hand.

(m) Boat winches shall be provided with means so that the falls may be overhauled by hand. These means must be in addition to hand cranks, and may consist of a hand grab rim on the brake shaft or brake drum.

(n) Where power-driven winches are used with gravity davits, positive means of automatically cutting off the power to the winch shall be fitted to stop the travel of the lifeboat and cradle before reaching final stowed position, to prevent damage to installation.

(o) Where power-driven winches are used with other type davits, the positive means for controlling power to the winch shall be by a master switch or controller so arranged that the operator must hold the master switch or controller in the "on or hoist" position for hoisting, and when released will immediately shut off the power.

(p) Every winch shall be fitted with a name plate of noncorrosive material, giving the maximum loads approved, the date the winch was passed, the type, serial number and the manufacturer's symbol. This plate is to be stamped with the inspector's initials, and the letters U S C G.

(q) Suitable covers shall be provided, so fitted that ice formation may be readily broken adrift when necessary to operate the winch.

(r) Shop test. Each winch shall be subject to the following test:

(1) Winches shall be set up to simulate a ship installation.

(2) Winches shall be capable of lowering, without undue strain or distortion, a test weight of 10 percent overload, based on the weight of the largest boat the winch is intended to handle, together with regular equipment and full number of persons (165 pounds for each person). The number of parts to the fall should be recorded.

(3) Brake shall be capable of stopping and holding the test weight at any point by the action of the counterweight alone.

(4) While the weight is being lowered through a range of not less than 20 feet, stops shall be made at intervals of several feet. Brakes exposed to the weather shall also be tested under the load lowering condition with the braking surface wetted.

(5) Winch must be capable of limiting the speed of lowering. This should not in general exceed 100 feet per minute.

(s) Installation tests: Upon completion of the installation of all mechanical means for lowering lifeboats, and before the vessel is certificated for service, the following tests and examinations shall be made in the presence of an inspector:

(1) Swing lifeboat out from chocks and lower to level for loading, at which point lifeboat shall be loaded with dead weight equivalent to the number of persons allowed (165 pounds per person) together with weight of equipment, plus 10 percent of the total load. The boat

should then be lowered to water, stopping at approximately 6-foot intervals by action of the counterweight alone. During this test the following observations should also be made:

- (i) Brake action shall be smooth, but positive. Brakes exposed to the weather shall also be tested under the load lowering condition with the braking surface wetted.
- (ii) Counterweight shall be capable of stopping and holding boat when released.
- (iii) Winch shall be capable of controlling the speed of lowering. This should not in general exceed 100 feet per minute.
- (iv) No part of lowering gear shall show any distress under load.
- (v) Deck under winch and davits must be of sufficient strength to prevent any undue stress of the deck under load.
- (vi) Mechanical davits shall swing to extreme outboard position without slacking winch brake.
- (vii) Action of governor brake and lowering speed permitted by same should be noted.
- (viii) Determine that falls are of sufficient length to lower lifeboats to light load line with vessel listed to 15° either way.
- (2) If nested boats are used, the hand operated quick recovery mechanism shall be tested and the action must be easy enough to permit one man to recover falls.
- (3) A report of the results of the installation tests covering all the above points shall be recorded.

59 4 Lifeboats required. Vessels of classes (a) and (b). Vessels of classes (a) and (b) shall be equipped with lifeboats in accordance with the preceding table, provided that such vessels shall not be required to carry more lifeboat capacity than is necessary to accommodate all persons on board. If the lifeboats attached to davits do not provide accommodations for the vessel's actual complement of passengers and crew, additional lifeboats of one of the standard types shall be installed to accommodate all persons on board, or to bring the complement of lifeboat capacity up to the minimum provided by the table, or to 75 percent of the complement of people on board, whichever is the greater. The remainder of the required equipment shall be provided by lifeboats of one of the standard types or approved life rafts. One of the lifeboats on each side of a vessel shall be of suitable size and design for doing emergency work at sea. Each of these boats shall be provided with at least four life lines fitted to a span between the davit heads of sufficient length to reach the water at the vessel's lightest seagoing draft. A releasing gear of the type which may be unhooked under tension is recommended in these boats. A sea painter should be passed along forward on the vessel when at sea and in the lifeboat a long eye, strop, and toggle should be fitted.

59 4a Buoyant apparatus required. On and after January 1, 1936, approved buoyant apparatus sufficient to accommodate 25 percent of all persons on board shall be required in addition to the lifesaving equipment specified above. Buoyant apparatus shall be stowed as follows:

- (a) They shall not impede in any way prompt handling of lifeboats, or the marshaling of persons on board at launching stations.
- (b) They shall be stowed in such manner as to be readily launched.
- (c) They shall not be secured to the deck except by lashings which can be easily slipped, but they may be stowed in tiers one above the other, in which case the separate units shall be kept apart sufficiently to prevent sticking together, and supported on suitable distance pieces.
- (d) Means shall be provided to prevent shifting.
- (e) Discretionary with Headquarters, the amount above required may be reduced when it is of the opinion that the construction, type and route of individual vessels warrant a reduction.
- (f) Where buoyant apparatus has been supplied and is now in use on vessels built in conformity with the rules of the Convention for the Safety of Life at Sea, 1929, in good

condition, and the apparatus conforms to the specifications of the convention, it may be kept in use on the ship for which it was originally supplied

59.5 Motor-propelled lifeboats All passenger vessels certificated for ocean service shall be provided, as part of their regular equipment, with motor-propelled lifeboats as follows

(a) Ships of more than 2,500 gross tons, plying routes on which they are at any point more than 200 miles offshore, shall be provided with one motor-propelled lifeboat

(b) Ships on which the number of lifeboats carried is more than 13 shall be provided with one motor-propelled lifeboat

(c) Where the number of lifeboats carried is more than 19, 2 shall be motor-propelled lifeboats

(d) Any lifeboat certified to carry 60 or more persons shall, if not one of the motor lifeboats required above, be motor-propelled or fitted with a hand-operated propeller

(e) Motor-propelled lifeboats shall comply with the requirements for a lifeboat of class 1, and the volume of the internal buoyancy and, where fitted, the external buoyancy shall be increased in sufficient proportion to compensate for the difference between the weight of the motor, the searchlight, and the radiotelegraph installation and their accessories, and the weight of the additional persons which the boat could accommodate if the motor, searchlight, and the radiotelegraph installation and their accessories were removed

59.6 Lifeboats required on vessels of class (c) (a) Cargo vessels shall carry a sufficient number of lifeboats on each side to accommodate all persons on board

(b) Towing, fishing, and wrecking vessels, and vessels in special service not carrying passengers or cargo, shall carry sufficient lifeboats to accommodate all persons on board, and the following types of boats may be used in lieu of the standard lifeboats

(1) Vessels engaged exclusively in the business of purse seining may use their wooden seine boats,

(2) Vessels engaged exclusively in the business of wrecking may use their wooden surf boats,

(3) Vessels engaged exclusively in the business of hook-and-line fishing from dories may use their dories when such dories are fitted with air tanks of sufficient capacity to meet the rule for necessary air-tank equipment

59.7 Carrying of lifeboats on vessels of classes (a) and (b) All vessels of classes (a) and (b) except those fitted with mechanical davits, shall, when the weather permits, have one of their lifeboats swung out on each side while at sea, braked into a boom or rail, and ready for immediate use

59.8 Lifeboats required on inspected motor vessels. All vessels propelled by machinery other than steam, subject to the inspection laws of the United States, shall be required to have the same lifeboat and life-raft equipment as steamers of the same class, and the Officer in Charge, Marine Inspection, shall so indicate in the certificate of inspection

Motor vessels under 50 tons, when navigating in daylight only, and when equipped with air tanks under deck of sufficient capacity to sustain afloat the vessel when full of water with her full complement of passengers and crew, or when properly subdivided by iron or steel watertight bulkheads of sufficient strength and so arranged and located that the vessel will remain afloat with her full complement of passengers and crew with any two compartments open to the sea, shall be required to have not less than 100 cubic feet of lifeboat capacity

59.9 Lifeboat and other equipment required on sail vessels. Sail vessels carrying passengers on the ocean under the provisions of R. S. 4417; as amended by the Act of Congress approved March 3, 1905, shall be subject to the same requirements for lifeboat capacity as ocean steamers of the same class, and in addition thereto they shall be equipped with a life preserver for each and every person on board

59.10 Lifeboats and their equipment required on inspected seagoing barges of 100 gross tons or over The lifeboats required on seagoing barges of 100 gross tons or over shall be of an approved type of at least 80 cubic feet capacity and equipped as follows

(a) **Boathooks.** Two boathooks of clear-grained white ash of suitable length but not less than 8 feet long by 1½ inches in diameter

(b) **Bucket.** One galvanized iron bucket of about 2-gallon capacity with lanyard attached

(c) **Life line** One life line properly secured the entire length on each side, festooned in bights not longer than 3 feet with a same float in each bight

(d) **Life preservers** Two life preservers in addition to the vessel's complement of life preservers

(e) **Oars.** Four oars and one steering oar

(f) **Painter** One painter of manila rope not less than 2¾ inches in circumference, and of a length not less than three times the distance between the boat deck and the light seagoing draft

(g) **Plugs** Drain holes, fitted with automatic plugs, shall be provided with two caps attached by chains

(h) **Rowlocks** Not less than four rowlocks attached to lifeboat by separate chains

(i) **Drinking cup** One enameled drinking cup

(j) **Drinking water** For each person at least 1 quart of drinking water contained in hermetically sealed cans of an approved type and stowed in the drinking water tanks, lockers, or other compartments providing suitable protection.

59.10a General requirements as to equipment for lifeboats, life rafts, and buoyant apparatus. (a) Articles of equipment for lifeboats, life rafts, and buoyant apparatus shall be of good quality, efficient for the purpose they are intended to serve, and kept in good condition

(b) Lifeboats, life rafts, and buoyant apparatus shall be fully equipped before the vessel leaves port, and the equipment shall remain in the boat, raft, or buoyant apparatus throughout the voyage. It shall be unlawful to stow in any boat, raft, or buoyant apparatus any articles not required by Chapter 1 of this title unless such articles can be properly stowed so as not to reduce the seating capacity or space available to occupants and so as not to adversely affect the seaworthiness of such lifeboats, rafts or buoyant apparatus

(c) Loose equipment shall be securely attached to the boat, raft, or buoyant apparatus to which it belongs. (Changes in specifications of articles of equipment shall not apply to articles of equipment which have been passed as satisfactory until replacement of such articles of equipment shall become necessary.)

59 11 Lifeboat equipment. Lifeboats, except those otherwise specified, shall be equipped as follows

(a) **Bailer.** One bailer of sufficient size and suitable for bailing with lanyard attached

(b) **Boathooks** Two boathooks of clear-grained white ash of suitable length but not less than 8 feet long by 1½ inches in diameter.

(c) **Bucket.** One galvanized iron bucket of about 2-gallon capacity, with lanyard attached

(d) **Compass and mounting.** One efficient liquid compass with not less than a 2-inch card. On and after January 1, 1948, all compasses and mountings for new installations or replacements shall be of an approved type. The Coast Guard specification for such approved type, which requires a card of not less than 3¾ inches in diameter, will be made available upon request

(e) **Distress signals.** Twelve approved hand red flare distress signals in a watertight container, and 4 approved floating orange smoke distress signals, or 12 approved hand combination flare and smoke distress signals in a watertight container. Service use shall

be limited to a period of 3 years from date of manufacture. Distress signals not bearing date of manufacture shall not be carried after January 1, 1949. (For specifications for the above signals, see subparts 160 021, 160 022, and 160 023 in Subchapter Q of this chapter.)

(f) **Parachute flare distress signals.** (1) Twelve approved parachute red flare distress signals and an approved means of projecting them, all contained in a portable watertight case. Service use for the signals shall be limited to a period of 3 years from date of manufacture. (For specifications for the above equipment, see subparts 160 024 and 160 036 in Subchapter Q of this chapter.)

(2) The stowage of this equipment, except in the emergency and motor lifeboats, is discretionary with the master.

(3) On cargo vessels, parachute red flare distress signal equipment need not be provided for more than two lifeboats.

NOTE—The specifications referred to in paragraphs (e) and (f) above are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the manufacture of equipment, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows:

160 021 Signals, Distress, Flare, Red, Hand (46 CFR subpart 160 021)

160 022 Signals, Distress, Smoke, Orange, Floating (46 CFR subpart 160 022)

160 023 Signals, Distress, Combination Flare and Smoke, Hand (46 CFR subpart 160 023)

160 024 Signals, Distress, Pistol-Projected Parachute, Red Flare (and Signal Pistol) (46 CFR subpart 160 024)

160 036 Signals, Distress, Hand-Held Rocket-Propelled Parachute, Red Flare (46 CFR subpart 160 036)

(g) **Ditty bag.** One canvas bag containing sailmaker's palm, needles, sail twine, marline, and marline spike.

(h) **Drinking cups.** Two enameled drinking cups.

(i) **Flashlight.** On and after September 1, 1945, one approve type I, size No. 3 flashlight complying with current U S Coast Guard Specification for Flashlights, Electric, Hand¹. No battery cell shall remain in the flashlight beyond the serviceability date appearing on the cell or its jacket. A flashlight which obtains its source of energy from other than dry cells may be used provided such flashlight has been approved by the Commandant, United States Coast Guard. Approved flashlights not conforming to the above referred to specification which are on board vessels prior to September 1, 1945, may be continued in service provided they are in good and serviceable condition, when replacement of these flashlights is effected, said flashlights shall comply with the requirement contained in this regulation.

(j) **Hatchets.** Two hatchets attached to the boat by individual lanyards and readily available for use, one at each end of the boat. All hatchets provided for use on vessels on and after December 1, 1944, shall be of an approved type. Hatchets provided prior to December 1, 1944, may be continued in service provided they are in good and serviceable condition.

(k) **Illuminating oil.** One gallon illuminating oil in metal container.

(l) **Lantern.** One lantern containing sufficient oil to burn at least 9 hours and ready for immediate use.

(m) **Life line.** A life line, or grab line, properly secured the entire length on each side, festooned in bights not longer than 3 feet, with a seine float in each bight. The life line shall be of a size and strength not less than 12-thread manila rope, and the seine float in each bight shall hang to within 12 inches of the surface of the water when the boat is light.

¹ A copy of the specifications is on file in the office of the Federal Register and copies may be obtained upon request from the Commandant (MMT), United States Coast Guard Headquarters, Washington 25, D C, or any Coast Guard District Commander.

(n) **Life preservers** Two life preservers These life preservers are in addition to the vessel's equipment of life preservers

(o) **Locker** A suitable locker or box for the storage and preservation of the small items of equipment

(p) **Mast and sails** A mast or masts with at least one good sail and proper gear for each, the sail and gear to be protected by a suitable canvas cover Where a vessel in the North Atlantic north of 35° north latitude is provided with a radiotelegraph installation, only one of the lifeboats on each side of the vessel shall be required to be so equipped

(q) **Matches** One box of friction matches in a watertight container, and carried in a box secured to the underside of the stern thwart, or stowed in locker

(r) **Oars** A single banked complement of oars, two spare oars, and a steering oar with rowlock or becket conforming to the following requirements

Minimum number and length of oars

Length of boat	Number of oars	Spare oars	Total in- cluding steering oar	Rowing oars	Steering oars
16 feet and under 18 feet	4	2	7	<i>Feet</i> 10	<i>Feet</i> 12
18 feet and under 20 feet	4	2	7	11	13
20 feet and under 24 feet	4	2	7	13	14
24 feet and under 28 feet	6	2	9	14	15
28 feet and over	6	2	9	15	16

NOTE.—Motor lifeboats and lifeboats fitted with propellers operated by hand shall be equipped with four oars and one steering oar

(s) **Painter** One painter of manila rope not less than 2½ inches in circumference and a length not less than three times the distance between the boat deck and the light draft

(t) **Plugs and pumps** Drainholes, fitted with automatic plugs, shall be provided with two caps attached by chains Decked lifeboats shall have no plug-hole, but shall be provided with at least two bilge pumps

(u) **Propellers (hand-operated).** Lifeboats may be fitted with a hand-operated propeller of an approved type, but all lifeboats, except motorboats, having a capacity of 60 or more persons, shall be fitted with a hand-operated propeller of an approved type

The hand-propelling gear shall be substantially constructed and fitted in the boat in an efficient manner and be such that the boat may be readily maneuvered away from the ship's side after being launched and steerageway maintained, under adverse weather conditions The gear shall be of such character that it may be operated by persons untrained in its use It shall be such that it can be operated satisfactorily when the boat is partially flooded and will be effective in propelling a boat fully or partially loaded

The above propelling gear shall be required in all such lifeboats fitted on new vessels and to the lifeboat replacements on existing vessels

(w) **Provisions** (1) Two pounds of provisions for each person consisting of hard bread or its equivalent in any approved emergency ration of cereal or vegetable compound packaged in hermetically sealed containers of an approved type and stowed in provision lockers or other compartments providing suitable protection No meat or other ration requiring saline preservative shall be allowed

(2) Passenger ships engaged in international voyages shall carry in each lifeboat one pound of condensed milk for each person the lifeboat is certified to carry If the vessel is operated in the North Atlantic, north of 35° North Latitude, only one-half the quantity of condensed milk is required

(x) **Rowlocks** One set and a half of thole pins or rowlocks attached to the lifeboat by separate chains

(y) **Rudder.** One rudder having either tiller or yoke and yoke lines The rudder shall be made of clear straight-grained oak or fir and shall be stiffened across the bottom edge by a piece of wood of the same character, properly secured Pintles shall be strapped to the wood and through fastened and be so adjusted that the lower pintle will project at least 1½ inches more below its gudgeon than does the upper one

(z) **Sea anchor** On and after January 1, 1944, all sea anchors shall be of an approved type

NOTE—Sea anchors installed prior to January 1, 1944, meeting the requirements of regulations effective at the time of installation may be continued in use if in serviceable condition

(aa) **Storm oil** One container holding 1 gallon of vegetable or animal oil, so constructed that the oil can be easily distributed on the water and so arranged that it can be attached to the sea anchor

(bb) **Drinking water** For each person at least 1 quart of drinking water contained in hermetically sealed cans of an approved type and stowed in the drinking water tanks, lockers, or other compartments providing suitable protection

(cc) (Canceled)

(dd) **Signaling mirrors.** Two signaling mirrors of an approved type

59.11a Motor lifeboat equipment In addition to the equipment required by § 59 10a and the provisions of § 59 11, motor lifeboats shall carry 2 fire extinguishers of the carbon tetrachloride type, but need not carry a mast or sails nor more than four rowing oars and one steering oar All motor lifeboats carried in compliance with § 59 5 shall be fitted with a radio installation and a searchlight

(a) **Motor and accessories.** The engine for motor-propelled lifeboats shall be of a reliable slow-speed heavy-duty type, permanently installed inside the lifeboat

The power of motor lifeboats shall be such that the speed through the water, in smooth water, shall be at least 6 knots when fully loaded Under these conditions, fuel capacity sufficient for 24 hours' continuous operation shall be provided

Suitable provision shall be made for going astern

The motor shall be protected by a weatherproof enclosure The top of the enclosure shall be constructed so that it may be removed when necessary and shall be fitted with a ventilator of a water-protector type.

Fittings, pipes, and connections shall be of high standard and good workmanship and installed in accordance with good practice There shall be a strainer between carburetor and fuel tank and an efficient hand starter

The motor of each lifeboat shall be operated ahead and astern for a period of not less than 5 minutes at least once in every 7 days to test its readiness for service, such operation to be part of the lifeboat drill and included in the report of such drill

The fuel shall be stored in substantial tanks of seamless steel, welded steel or copper firmly secured inside the lifeboat and suitably located The fuel tank should be emptied and fuel changed at least once a year The storage of fuel outside the lifeboat using it is prohibited,

Motorboats certified for 100 or more persons shall be fitted with at least two bilge pumps, one of which shall be an efficient hand pump The bilge pumps are each to be capable of pumping from each compartment Motorboats certified for less than 100 persons shall be fitted with a bilge pump, either hand or power, having suitable suction or drainage to different parts of the boat

(b) **Searchlight** The searchlight provided for use on motor lifeboats shall be so constructed as to project a beam of light at least 200 yards and at that distance effectively

illuminate a light-colored object over a width of about 60 feet. The light shall be capable of turning in its mounting base through a horizontal angle of 360° and it shall be possible by further adjustment to direct the light rays at least 60° upward and at least 45° downward from the horizontal plane. There shall be suitable manual adjustment for securely locking the searchlight in all positions.

The searchlight shall be substantially constructed of noncorrosive materials and properly mounted. It shall be of weatherproof construction capable of resisting the corroding effects of moist salt atmosphere and the effects of extreme heat and extreme cold. The light shall be capable of resisting several severe shocks and vibrations without damage.

The source of power for the searchlight shall be capable of operating the light intermittently for a period of 6 hours and continuously for a period of 3 hours. Where the power for the radio equipment and the searchlight are derived from the same source, this shall be sufficient to provide for the adequate working of both appliances.

Two spare bulbs shall be provided for the searchlight and carried in the motor lifeboat. Searchlights installed on new motor lifeboats or installed as replacements on existing motor lifeboats shall be of an approved type.

(c) **Radio installation.** The radio installation shall comply with the requirements of the Federal Communications Commission for this purpose.

59 12 Standard types of boats. The standard types of boats are classified as follows:

Class	Section	Type
I Entirely rigid sides	(A) Open	Internal buoyancy only
	(B) Open	Internal and external buoyancy
	(C) Pontoon	Well deck, fixed watertight bulwarks
II Partially collapsible sides	(A) Open	Upper part of sides collapsible
	(B) Pontoon	Well deck, collapsible watertight bulwarks
	(C) Pontoon	Flush deck, collapsible watertight bulwarks

59 13 Drawings, specifications, name plate. (a) All lifeboats shall be substantially constructed in accordance with drawings, or blueprints, and specifications approved by the Commandant. The approval of lifeboat shall include the arrangements for stowage of all equipment.

(b) Builders of lifeboats shall furnish the Coast Guard District Commander of the district in which the lifeboats are built drawings, or blueprints, and specifications showing and explaining the construction of same, and showing the tensile strength and ductility of the metal used. Lifeboats may be constructed of steel having a minimum tensile strength not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches, or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved metals. Where steel is used and the minimum thickness of the metal is less than No. 16 B. W. G., the elongation shall not be less than 15 percent in a gage length of 8 inches.

(c) Builders of lifeboats shall affix a plate of brass or the equivalent to each lifeboat, having thereon the builder's name, number of boat, date of construction of boat, cubical contents of boat, and number of persons said boat will carry, as determined by the rules of the Commandant.

59 14 Inspection of lifeboats when built. Coast Guard District Commanders of districts where lifeboats are built shall detail an inspector to any place where lifeboats are being built, whose duty it shall be to carefully inspect and examine the construction of such lifeboats, and he shall satisfy himself that such lifeboats are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders. When the inspector approves the construction of the boat, he shall stamp his initials, together with the letters

"U S C G," on a blank space on the plate required to be affixed to the boat by the builder. The initials of the inspector shall be satisfactory evidence to all parties interested that the boat has been constructed in accordance with the drawings, or blueprints, and specifications on file.

59.15 Construction of metallic lifeboats of class 1A The following specifications and schedule of lifeboat material shall be complied with unless other arrangements in matters of constructional details, design and strength equivalent in safety and efficiency are approved by the Coast Guard District Commander of the district in which the lifeboat is built.

(a) **Keel, stem, and sternpost** The dimensions of bar keels, stems, and sternposts shall be as given in table. The keel, stem, and sternpost shall be in one length except in the case of a boat of stern-frame construction, where the stem and keel shall be in one length, scarphed and riveted to the stern frame. The scarph connecting the keel to the stern frame shall have a length of nine times the thickness of the keel, or butt welded with suitable reinforcing straps on both sides.

(b) **Shell plating** The gage of shell plating shall be as given in table and shall have a tensile strength of not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches, or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved metals. When the minimum thickness of the steel is less than No. 16 B W G the elongation shall be not less than 15 percent in a gage length of 8 inches. The bottom shell plating shall be increased to gages as shown in table for not less than 25 percent of the breadth each side of the keel. Doubling plates of suitable size shall be fitted on all steel boats at points where the shell is liable to corrosion from contact with the boat's chocks. All seam and butt laps shall lap at least $1\frac{1}{4}$ inches. The laps of joints on keel, stem, and sternpost shall be at least two inches.

(c) **Riveting.** The several plates composing the shell may be joined together either by riveting or welding. Where riveting is employed, it shall be by double riveting. The center of the row of rivets nearest the edge of a sheet shall be about three-eighths of an inch from the edge. The rivets shall be staggered with not less than 18 rivets to the foot and such rivets shall have countersunk heads. The diameter of the rivets shall be not less than No. 10 B W G. The riveting of the shell plating to the keels, stems, and sternposts shall be with buttonhead rivets of the following diameters, said riveting to be staggered with not less than 12 rivets to the foot.

	<i>Inch</i>
Boats 24 feet or under.....	$\frac{3}{16}$
Over 24 feet, under 27.....	$\frac{1}{4}$
Over 27 feet, under 32.....	$\frac{5}{16}$

In the attachment of the keel to the garboard plate, the distance from the edge of the plate to the center of the nearest row of rivets shall be about one-half an inch.

(d) **Welding** Where welding is employed in lifeboat or life raft construction it shall be in accordance with the following specifications for fusion welding of sheet metal and the welders shall be qualified by the Coast Guard.

(e) **Scope.** These specifications apply only to the application of fusion welding to lifeboats, life rafts, and similar vessels subject to pressures not to exceed 15 pounds per square inch.

(f) **Materials—(1) Base metal** The materials shall be steel or wrought iron plates (galvanized) having a thickness of not less than No. 18 B W G nor more than three-sixteenths inch.

(2) **Filler metal** High-test electrode shall be used to insure a weld which will have an efficiency equal to the strength of the base metal without reinforcement.

(g) **Process** Any process of welding which has been approved by the Commandant may be used in the fabrication of lifeboats and life rafts

(h) **Design of joints** The following joints are acceptable Butt joints or lapped joints, fillet-welded at both edges

(i) **Application of welding** The plates shall be properly formed and secured by jigs, clamps, or other suitable devices to prevent sagging or warping The welder shall use due caution to avoid heating the plate to such an extent as to cause it to become distorted or warped Care shall be taken to insure that the weld has complete fusion, proper penetration to the full thickness, and is reasonably free from porosity Provision should be made to provide for reasonable expansion and contraction while the welding is being applied The weld shall be machined to a reasonable degree of smoothness and galvanized by spraying with zinc to protect against the weather

(j) **Supervision** Manufacturers who desire to construct lifeboats or life rafts by means of any process of fusion welding shall submit plans and specifications to the Coast Guard District Commander, showing in detail the design and methods of construction which they propose to employ The plans or specifications shall contain the following data

- (1) Tensile strength of the base metal
- (2) Elongation of base metal in a gage length of 4 inches
- (3) Trade name of electrode used
- (4) Elongation of filler metal in a gage length of 2 inches

(k) **Inspection and tests** Inspectors shall have access to life boats, life rafts, etc., under construction in order to ascertain whether the material and technique is such as to insure dependable workmanship Two tension and two bend test specimens of welding shall be taken from the first lifeboat or life raft constructed by fusion welding in any one order, thereafter two tension and two bend test specimens of welding shall be taken from one boat in each lot of twenty-five lifeboats and from one raft in each lot of twenty-five rafts in the same order The tension test specimens shall be made with a reduced section having a gage length of 4 inches The edges of the bend test specimens may be parallel Both tension and bend test specimens shall be made with the weld in the center The reinforcement shall be ground off, and the tension test specimen shall show under test a tensile strength at least equal to that of the base metal The bend test shall be made in a vise with the face of the weld in tension and must withstand being bent to a radius of twice its thickness without showing cracks or flaws The inspector making the tests shall satisfy himself that the workmanship is such that the boat or raft so constructed is at least equal in strength and dependability to an approved metallic lifeboat or raft of riveted construction

(l) **Floors** Floors shall be fitted in lifeboats 26 feet in length and over, of such dimensions as indicated in table

The floors shall be flanged $1\frac{1}{2}$ inches top and bottom and fastened to the skin by a single row of rivets three-sixteenths inch in diameter and pitched 3 inches on centers

Lumber holes shall be cut in the floors and so located as to provide efficient draining

(m) **Gunwales** The dimensions of angular steel gunwales shall be as given in table The gunwales on each side of the lifeboat shall be in not more than two pieces If the gunwales are fitted in two lengths, the butts shall be kept beyond the midship half-length of the boat and at opposite ends on each side The joint may be riveted or welded, and the backing-up piece shall be angular in section of the thickness of the gunwale, and the length shall be not less than eight times the depth of the gunwale It shall be secured to the sheer strake by riveting or welding The gunwales may be of clear grain oak or teak When made in two lengths the gunwales shall be scarphed with a good long bevel scarph

stiffened on the under side by a piece of the same material at least 2 feet long, $1\frac{1}{4}$ inches thick, and of the same width as the gunwale. Fastenings securing the gunwale bar or wooden gunwale to the sheer plate shall be spaced on three-inch centers. The size of gunwales shall be of not less than the following dimensions:

Length of boat	Depth of gunwale	Width of gunwale
	<i>Inches</i>	<i>Inches</i>
12 feet and not over 18 feet	$1\frac{1}{8}$	$2\frac{1}{8}$
Over 18 and not over 20 feet	$1\frac{1}{8}$	$2\frac{1}{8}$
Over 20 and not over 22 feet	2	$2\frac{1}{8}$
Over 22 and not over 24 feet	$2\frac{1}{8}$	$2\frac{1}{8}$
Over 24 and not over 26 feet	$2\frac{1}{8}$	$2\frac{1}{8}$
Over 26 feet	$2\frac{1}{8}$	$2\frac{1}{8}$

(n) **Nosings.** The outside of the gunwale angle shall have a nosing of clear grain oak or teak secured to the sheer plate and the gunwale by fastenings spaced on 6-inch centers which fastenings may be substituted for alternate fastenings between the gunwale bar or the wooden gunwale and the sheer strake, the flat side of the nosing on boats not over 20 feet long shall be not less than $1\frac{1}{2}$ inches wide and $\frac{5}{8}$ inch thick, on boats over 20 feet and not over 24 feet it shall be not less than $1\frac{1}{8}$ inches wide and 1 inch thick, on all boats over 24 feet, it shall be not less than $2\frac{1}{4}$ inches wide and 1 inch thick.

Steel gunwales made from steel plates bent to a $\frac{1}{2}$ inch inside radius need not be fitted with nosings. The vertical leg of the gunwale shall be outboard of the sheer strake.

(o) **Gunwale braces.** The gunwales shall be secured to the thwarts by steel braces and teed on the thwarts as follows:

Length of boat	Size of brace	Teed on thwarts
	<i>Inches</i>	<i>Inches</i>
22 feet and under	$\frac{5}{16}$ by $1\frac{3}{4}$	$\frac{4}{8}$
Over 22 feet	$\frac{3}{8}$ by $1\frac{1}{2}$	$\frac{4}{8}$

The gunwale braces shall be bolted to thwarts and riveted, or welded to gunwales.

(p) **Breastplates.** Breastplates shall be fitted to the stem and sternpost, the thickness of the breastplates to be not less than the thickness of the leg of the gunwale. The depth of the throat of the plate shall be not less than twice the depth of the gunwale.

(q) **Thwarts.** The dimensions of the thwarts shall be as given in table except that the mast thwarts shall be 2 inches wider and the hole properly reenforced. The number of thwarts shall be not less than the following:

Length of boat	Number of thwarts
Under 18 feet	4
18 feet and under 24	5
24 feet and under 28	6
28 feet and under 32	7

The thwart ends shall be fitted between flanges and secured thereto by bolts in addition to the bolts through the gunwale braces. The U flange shall extend inboard to take the brace bolt, which shall be 1 inch in width less than the thwart. Stretchers or lower cross seats of sufficient size and strength shall be fitted in suitable positions for the efficient rowing of all boats. In boats over 20 feet in length where lower cross or side seats are required to be fitted, they shall be well secured and supported. They shall not be placed more than 12 inches above the floors.

(r) **Stanchions** Stanchions shall be fitted in all lifeboats where the unsupported length of the thwarts exceeds $4\frac{1}{2}$ feet

(s) **Footings** Footings shall cover the bottom of the boat between the side tanks, spaced not more than 2 inches apart. The width of the footings shall be not less than $7\frac{1}{2}$ inches except the center footing, which shall not be less than $9\frac{1}{2}$ inches

The footings shall be made readily portable, and so arranged that the plugs are at all times directly accessible without removing any fitting

Metallic lifeboat

Length of boat not over—	Bar keel, stem and sternpost	Angle bar gun wales	Shell plate		Floors		$\frac{1}{2}$ Nosing hollow round	Fir or yellow pine thwarts	Fir or yellow pine stanchions	Fir or pine side and end benches	Yellow pine foot logs	Tackle and painter shackles
			Side plating	Bottom plating	Depth not less than—	Thickness	Spacing not more than—					
12 feet 0 inches	$2\frac{1}{4}$ by $\frac{1}{4}$	2 by $1\frac{1}{4}$ by $\frac{1}{4}$	No 18 B W G	No 18 B W G	$1\frac{1}{2}$		$1\frac{1}{2}$	$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by $7\frac{1}{4}$	$1\frac{1}{4}$ by $4\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
14 feet 0 inches	$2\frac{1}{4}$ by $\frac{1}{4}$	2 by $1\frac{1}{4}$ by $\frac{1}{4}$	do	do				$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by $7\frac{1}{4}$	$1\frac{1}{4}$ by $4\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
16 feet 0 inches	$2\frac{1}{4}$ by $\frac{1}{4}$	2 by $1\frac{1}{4}$ by $\frac{1}{4}$	do	do				$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by $7\frac{1}{4}$	$1\frac{1}{4}$ by $4\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
18 feet 0 inches	$2\frac{1}{4}$ by $\frac{1}{4}$	2 by 2 by $\frac{1}{4}$	do	do				$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by $7\frac{1}{4}$	$1\frac{1}{4}$ by $4\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
20 feet 0 inches	$2\frac{1}{4}$ by $\frac{1}{4}$	2 by 2 by $\frac{1}{4}$	No 16 B W G	No 16 B W G				$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by $7\frac{1}{4}$	$1\frac{1}{4}$ by $4\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
22 feet 0 inches	$2\frac{1}{4}$ by $\frac{3}{4}$	2 by 2 by $\frac{1}{4}$	do	do				$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by $7\frac{1}{4}$	$1\frac{1}{4}$ by $4\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
24 feet 0 inches	3 by $\frac{3}{4}$	$2\frac{1}{4}$ by 2 by $\frac{1}{4}$	do	do				$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by 9	$1\frac{1}{4}$ by $4\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
26 feet 0 inches	3 by $\frac{3}{4}$	$2\frac{1}{4}$ by 2 by $\frac{1}{4}$	No 14 B W G	No 13 B W G	6	No 14 B W G	36	$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by 9	$1\frac{1}{4}$ by $8\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
28 feet 0 inches	$3\frac{1}{4}$ by $\frac{3}{4}$	$2\frac{1}{4}$ by $2\frac{1}{4}$ by $\frac{1}{4}$	do	do	6	do	36	$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by 9	$1\frac{1}{4}$ by $8\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
30 feet 0 inches	$3\frac{1}{4}$ by $\frac{3}{4}$	$2\frac{1}{4}$ by $2\frac{1}{4}$ by $\frac{1}{4}$	do	do	6	do	30	$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by 9	$1\frac{1}{4}$ by $8\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
32 feet 0 inches	4 by $\frac{3}{4}$	$2\frac{1}{4}$ by $2\frac{1}{4}$ by $\frac{1}{4}$	do	do	6	do	30	$2\frac{1}{4}$ by $\frac{1}{4}$	$1\frac{1}{4}$ by 9	$1\frac{1}{4}$ by $8\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$

(t) **Hoisting shackles** Hoisting or lifting shackles when installed in the ends of lifeboats shall have the shackle pins go through the stem and sternpost. Sectional area around the shackle pinhole shall be at least equal to the area of the shackle specified for the lifeboat. In cases where the lifting shackles are required to be installed inside of the lifeboat, such lifting shackles shall be attached to bracket plates, riveted to stem and sternpost or to rods with bracket plates riveted to keel. The complete unit for each boat of the brackets, rods, and connecting bolts shall be of sufficient strength to support the loaded lifeboat with a safety factor of 6. Hooks may be allowed in lieu of lifting shackles when constructed with a safety factor of 6, except when disengaging apparatus is required. Rings or links shall not be attached to lifeboats for hoisting purposes. When attached to the lower tackle blocks they shall be of such strength as to resist the proof load test without set, six times the maximum working load. The safety factor of 6 referred to is on material having a tensile strength of 58,000 to 65,000 pounds per square inch.

(u) **Plug.** Each lifeboat shall be fitted with an automatic plug.

(v) **Galvanizing and plating** All steel or iron entering into the construction of lifeboats shall be galvanized by the hot process.

59.16 Construction of wooden lifeboats—(a) Materials The timber shall be of the best quality, well seasoned, free from sapwood, shakes, and objectionable knots. The other materials shall be the best of their respective kinds.

(b) **Framings.** Keels, stems, sternposts, aprons, and deadwoods shall be oak or elm with no short grain or shakes. Parts having considerable curvature shall be oak or hackmatack grown to form. The stem and sternpost are to be rabbeted to take the plank ends and form an efficient stop for the caulk. The depth of the rabbet shall not exceed the thickness of the plank. Aprons shall be of sufficient size to insure a 3-inch faying surface and receive the double fastenings of the hooded ends. Deadwoods are to be of the same size.

as the keel and are to scarph properly with the apron and keelson. The timbers are to be checked into the deadwoods and cavities filled with marine glue to form a water course. Keel and hog piece shall be elm or oak, and the keel shall be in one length. Scarphs connecting the stem and sternpost to the keel may be either vertical or horizontal. The vertical scarphs shall be secured by five clinched nails, and the horizontal or flat scarphs shall be properly lipped and secured by at least two through fastenings. Ordinary tenons shall not be accepted as equivalent to scarphs. Stem bands shall be galvanized wrought iron and extend from the breasthook over the stem head to keel plate or 2 feet abaft the scarph.

(c) **Planking.** The planking may be of the clincher, carvel, or multiple-skin types, the carvel and double plank to be recommended, especially the latter when for use on vessels in tropical trades. In clincher-built boats the extreme breadth of the plank is not to exceed $5\frac{1}{2}$ inches, except in the four strakes next to the keel, which may be as follows: two at 7 inches, one at $6\frac{1}{2}$ inches, and one at 6 inches. In boats 18 feet in length and under, these breadths may require to be reduced about an inch. The landings shall not be less than seven-eighths inch in breadth. The planks should be in as long lengths as possible, with an efficient shift of butts. There shall be at least two passing strakes between butts in the same timber space.

(d) **Timbers.** Timbers shall be elm or oak bent to shape and fitted in one length from gunwale to gunwale, except in the extreme ends of the boats. The spacing of timbers shall not exceed 6 inches center to center.

(e) **Stiffeners.** Keelsons shall be in one length and overlap the deadwoods so as to take all the fastenings of the lifting plates. A substantial hardwood chock shall be well secured to the keelson to form a mast step, the keelson shall not be cut for the purpose. The bilge stringers and risings should be in as long lengths as possible, properly scarphed at the butts, and either through fastened at each timber or fastened at each timber with a brass screw. In boats 25 feet in length and over, the heads of the timbers are to be carried up and connected through the sheer strake and gunwale. In all boats, provisions shall be made for double-banking the pars.

(f) **Thwarts and stanchions, etc.** The number of thwarts shall not be less than given by the following:

Lifeboats, length in feet	Number of thwarts
18 and under.....	4
Over 18 and not over 24.....	5
Over 24 and not over 28.....	6
Over 28 and not over 30.....	7

The distance of the top of the thwarts below the top of the gunwale shall be as follows:

Lifeboats, length in feet	Inches
22 and under.....	9
Over 22 and not above 28.....	10
Over 28 and not above 30.....	11

The thwarts shall be scored over the timbers and directly attached to the risings by means of 2 screws at each end. In all boats where the unsupported length of the thwarts exceeds 5 feet, stanchions well connected to the thwart and to the side of keelson shall be fitted. The side benches shall be continuous and fitted in as long lengths as possible, they shall not be removable, but form part of the permanent structure of the boat. In boats over 20 feet in length where lower cross or side seats are required to be fitted, they are to be well secured and supported. They shall be placed as low as practicable. Stretchers or lower cross seats of sufficient size and strength are to be fitted in suitable positions for the

efficient rowing of all boats All lower seats and bottom boards are to be made readily portable, and so arranged that the plugs are at all times directly accessible without removing any fitting The plug chains are to be securely attached to the boat by screws

(g) **Thwart knees.** The knees shall be of wrought or stamped iron, galvanized $1\frac{1}{2}$ inches thick at the thwart In lifeboats over 24 feet in length, the knees shall be double, but, in lieu thereof, iron knees of special design may be adopted The knees shall be connected to the side of the boat and to the thwarts by at least 2 through fastenings in each arm Nut and screw bolts are recommended for the purpose The bolts should be cup-headed and the nuts have iron plate washers on the under side of the thwarts Any additional fastenings may be stout screws, but spike or wire nails are not to be allowed A hardwood chock 3 inches wide should be fitted between knee and side of boat to receive knees and fastenings of sheer strake Where wood knees are preferred, they should be of oak, ash, elm, or hackmatack grown to form The fastenings may be galvanized iron, but wire nails shall not be allowed

(h) **Breasthooks** The sides of the boat at the ends shall be well bound together across the middle line, the breasthooks being of sufficient number and size, having regard to the dimensions and form of the boat The arms are to extend along the sides of the boat for at least two timber spaces and are to be through fastened by two bolts in each arm and one through the throat The breasthooks are to be galvanized iron, or oak or hackmatack grown to form

(i) **Rubbers, filling pieces, bilge keels.** Fore and aft rubbers shall be fitted to all boats Clincher-built boats are to have filling pieces for about one-third of the boat's length amidships, fitted to the projecting plank edges from the gunwale to the bilge In all boats intended to accommodate more than 60 persons, vertical fenders, extending from the gunwale down to the bilge, are to be fitted to facilitate launching on the high side of a listed ship These fenders are to be sufficient in number to prevent damage to the boats when being lowered If the fenders are of wood they are to have cope iron fitted to the outside edges Particulars of any proposed arrangements, including alternatives such as skates or rollers, temporarily secured to the boat to prevent it from being damaged, and to facilitate launching, are to be submitted for the Commandant's approval When bilge keels are fitted, they shall be secured to a doubling plank well fastened to the bottom planking and timbers by brass screws Bilge-keel fastening shall not penetrate the bottom planking Suitable hand grips shall be made in the bilge keels for use in event of capsizing

(j) **Fastenings.** Fastenings of the keel, stem and sternpost, aprons, knees, keelsons, or deadwood shall be through fastenings wherever practicable, or long screws There shall not be less than 6 through fastenings in the deadwood at each end of the boat The hog shall be secured to the keel by galvanized screws 8 inches to 7 inches apart, and the keelson to the keel by through fastenings 24 to 27 inches apart In boats over 23 feet in length, the hog may be in two pieces provided it is scarphed to the satisfaction of the inspector Box gunwales shall be through fastened at every timber, and solid gunwales should be secured with at least four through fastenings between each pair of thwart knees and strengthened by check pieces in way of rowlocks All gunwales when not fitted in one length shall have either lipped or table scarphs, and the scarphs of gunwale shall be kept if possible beyond midship half length of the boat Plank fastenings shall be copper of sufficient length and gage, and those in the plank edges, scarphs, and timbers properly clinched One fastening is required between the timbers in each edge of each plank, subject to a maximum spacing of $3\frac{1}{2}$ inches in clincher-built boats

59.17 Open boats with internal and external buoyancy, class 1B. The internal buoyancy of a wooden boat of this type shall be provided by watertight air cases, the total volume of which is at least equal to $7\frac{1}{2}$ percent of the cubic capacity of the boat The

external buoyancy may be of cork or of any other equally efficient material, but such buoyancy shall not be secured by the use of rushes, cork shavings, loose granulated cork, or any other loose granulated substance, or by any means dependent upon inflation by air. If the buoyancy is of cork, its volume, for a wooden boat, shall not be less than thirty-three thousandths of the cubic capacity of the boat, if of any material other than cork, its volume and distribution shall be such that the buoyancy and stability of the boat are not less than that of a similar boat provided with buoyancy of cork. The buoyancy of a metal boat shall be not less than that required above for a wooden boat of the same cubic capacity, the volume of the air cases and external buoyancy being increased accordingly. Boats of this class shall have a mean sheer equal to at least 4 percent of their length.

59 19 Boats equivalent to boats of class 1B Any type of boat may be accepted as equivalent to a boat of class 1B after blueprints and specifications have been submitted and a practical demonstration of a full-size boat is witnessed by the Commandant.

59 20 Pontoon boats in which persons cannot be accommodated below deck, having a well deck and fixed watertight bulwarks, class 1C The area of a well deck of a boat of this type shall be at least 30 percent of the total deck area. The height of the well deck above the water line at all points shall be at least equal to one-half percent of the length of the boat, this height being increased to $1\frac{1}{2}$ percent of the length of the boat at the ends of the well. The freeboard of a boat of this type shall be such as to provide for a reserve buoyancy of at least 35 percent.

59 21 Boats of the second class The standard types of boats of the second class shall satisfy the conditions set forth in §§ 59 22-59 35.

59 22 Open boats having the upper part of the sides collapsible, class 2A A boat of this type shall be fitted both with watertight air cases and with external buoyancy, the volume of which, for each person which the boat is able to accommodate, shall be at least equal to the following amounts. Air cases, $1\frac{1}{2}$ cubic feet, external buoyancy (if of cork), $\frac{3}{4}$ cubic foot. The minimum freeboard of boats of this type is fixed in relation to their length, it is measured vertically to the top of the solid hull at the side amidships, from the water level when the boat is loaded. The freeboard in fresh water shall not be less than the following amounts:

Length of the boat	Minimum freeboard
<i>Feet</i>	<i>Inches</i>
26	8
28	9
30	10

The freeboard of boats of intermediate lengths is to be found by interpolation.

59 23 Pontoon boats having a well deck and collapsible bulwarks, class 2B All the conditions laid down for boats of type 1C are to be applied to boats of this type, which differ from those of type 1C only in regard to the bulwarks.

59.24 Pontoon boats in which persons cannot be accommodated below deck, having a flush deck and collapsible bulwarks, class 2C The minimum freeboard of boats of this type is independent of their lengths and depends only upon their depth. The depth of the boat is to be measured vertically from the underside of the garboard strake to the top of the deck at the side amidships, and the freeboard is to be measured from the top of the deck at the side amidships to the water level when the boat is loaded. The freeboard in fresh water

shall not be less than the following amounts, which are applicable without correction to boats having a mean sheer equal to 3 percent of their length

Depth of boat	Minimum freeboard
<i>Inches</i>	<i>Inches</i>
12	2 $\frac{3}{4}$
18	3 $\frac{1}{4}$
20	5 $\frac{1}{4}$
30	6 $\frac{1}{4}$

For intermediate depths the freeboard is obtained by interpolation. If the sheer is less than the standard sheer defined above, the minimum freeboard is obtained by adding to the figures in the table one-seventh of the difference between the standard sheer and the actual mean sheer measured at the stem and sternpost. No deduction is to be made from the freeboard on account of the sheer being greater than the standard sheer or on account of the camber of the deck. Pontoon lifeboats may be built of wood or metal. If constructed of wood, they shall have the bottom and deck made of two thicknesses with textile material between, if of metal, they shall be divided into watertight compartments, with means of access to each compartment.

59 25 Arrangements for clearing pontoon lifeboats of water. All pontoon lifeboats shall be fitted with efficient means for quickly clearing the deck of water. The orifices for this purpose shall be such that the water cannot enter the boat through them when they are intermittently submerged. The number and size of the orifices shall be determined for each type of boat by a special test. For the purpose of this test the pontoon boat shall be loaded with a weight of iron or bags of sand equal to that of its complement of persons and equipment. In the case of a boat 28 feet in length, 2 tons of water shall be cleared from the boat in a time not exceeding the following: type 1C, 60 seconds; type 2B, 60 seconds; type 2C, 20 seconds.

59 26 Type of boat equivalent to boat of class 2. Any type of boat may be accepted as equivalent to a boat of class 2 after blueprints and specifications have been submitted to, and a practical demonstration of a full-size boat has been witnessed by, and the type of boat has been approved by, the Commandant.

59 30 Air tanks of lifeboats. All lifeboats contracted for after September 30, 1912, shall have not more than 50 percent of the air tank capacity in the ends of the boat and the remaining capacity shall be located in the side tanks. After June 20, 1912, the air tanks of all lifeboats shall be entirely independent of the hull or other construction and shall be of suitable noncorrosive material and of a capacity of not less than 1.5 cubic feet for each person allowed in metallic boats and not less than 1 cubic foot for each person allowed in wooden boats. *Provided*, That in all metallic boats constructed and inspected on and after March 1, 1931, there shall be at least 1 cubic foot for each person allowed in addition to sufficient air-tank capacity to float the boat (including its equipment), when filled with water. Such air tanks shall be firmly and securely fastened in the hull, and in such manner as will allow them to be temporarily removed, and in no case shall the tanks be punctured or opened for such fastenings. The tops of such tanks shall be thoroughly protected by a grating or platform or by the thwarts or seats. Such air tanks of 6 cubic feet or less shall be constructed of material of a thickness not less than No. 22 B. W. G., from 6 cubic feet to and including 15 cubic feet, of a thickness not less than No. 20 B. W. G., and all air tanks of more than 15 cubic feet capacity shall be of a thickness not less than No. 18 B. W. G. All joints of air tanks shall be properly double riveted and tightly calked or securely hook-jointed and efficiently soldered or properly and securely welded, and such air tanks shall be located in such a manner that will permit the lifeboat to be on as near an even keel as possible when flooded with water. The cubical contents of air space of an tank shall be stamped on the tank where same can

be seen when air tank is placed in boat. All air tanks shall be fitted with a connection of one-half inch outside diameter for testing purposes. Before any lifeboat is passed and accepted, the air tanks thereof shall be tested in the presence of an inspector by an air pressure of not more than 1 pound to the square inch. At each subsequent annual inspection, or oftener if in the opinion of the inspectors it is necessary or desirable, the inspectors shall satisfy themselves that the tanks are in good condition, but pressure need not be applied unless the inspectors are in doubt regarding the efficiency of the tanks. This does not take from the inspectors the right and authority to satisfy themselves at any time, either by examination or pressure, as to the condition of tanks.

59 31 Cubic capacity of open boats of the first class. (a) The cubic capacity of an open boat of type 1A or 1B shall be determined by Stirling's (Simpson's) rule or by any other method, approved by the Commandant, giving the same degree of accuracy. The capacity of a square-sterned boat shall be calculated as if the boat had a pointed stern.

(b) For example, the capacity in cubic feet of a boat, calculated by the aid of Stirling's rule, may be considered as given by the following formula

$$\text{Capacity} = \frac{l}{12}(4A + 2B + 4C)$$

l being the length of the boat in feet from the inside of the planking or plating at the stem to the corresponding point at the sternpost, in the case of a boat with a square stern, the length is measured to the inside of the transom. A, B, C denote, respectively, the areas of the cross sections at the quarter length forward, amidships, and the quarter length aft, which correspond to the three points obtained by dividing l into 4 equal parts. (The areas corresponding to the two ends of the boat are considered negligible.) The areas A, B, C shall be deemed to be given in square feet by the successive application of the following formula to each of the three cross sections

$$\text{Area} = \frac{h}{12}(a + 4b + 2c + 4d + e)$$

h being the depth measured in feet inside the planking or plating from the keel to the level of the gunwale, or, in certain cases, to a lower level, as determined hereafter. a, b, c, d, e denote the horizontal breadths of the boat measured in feet at the upper and lower points of the depth and at the three points obtained by dividing h into four equal parts (a and e being the breadths at the extreme points, and c at the middle point, of h).

(c) If the sheer of the gunwale, measured at the two points situated at a quarter of the length of the boat from the ends, exceeds 1 percent of the length of the boat, the depth employed in calculating the area of the cross sections A or C shall be deemed to be the depth amidships plus 1 percent of the length of the boat.

(d) If the depth of the boat amidships exceeds 45 percent of the breadth, the depth employed in calculating the area of the midship cross section B shall be deemed to be equal to 45 percent of the breadth, and the depth employed in calculating the areas of the quarter-length sections A and C is obtained by increasing this last figure by an amount equal to 1 percent of the length of the boat, provided that in no case shall the depths employed in the calculation exceed the actual depths at these points.

(e) If the depth of the boat is greater than 4 feet, the number of persons given by the application of this section shall be reduced in proportion to the ratio of 4 feet to the actual depth, until the boat has been satisfactorily tested afloat with that number of persons on board, all wearing life jackets.

(f) The following rule may be used, provided it does not give a greater capacity than that obtained by the above method. Measure the length and breadth outside of the planking or plating and the depth made at the place of minimum depth. The depth used in calcu-

lating shall not in any case exceed 45 percent of the breadth. The product of these dimensions multiplied by 0.6 resulting in the nearest whole number shall be deemed the capacity in cubic feet. To determine the number of persons a boat may carry, divide the result by 10 for ocean steam vessels.

Example. The carrying capacity of a boat 22 feet in length, 6 feet in breadth and 2½ feet in depth shall be determined as follows:

$$\frac{22 \times 6 \times 2\frac{1}{2} \times 0.6}{10} = \frac{198}{10} = 19 \text{ persons}$$

In all cases the vessel owner has the right to require that the cubic capacity of the boat shall be determined by exact measurement.

(g) The cubical capacity of a motor boat shall be obtained by deducting from the gross capacity a volume equal to that occupied by the motor and its accessories, and, when carried, the wireless installation and searchlight with their accessories.

(h) The cubical capacity of a lifeboat propelled by hand-operated propeller shall be obtained by deducting from the gross capacity a volume equal to that occupied by such device.

(i) When computing the air-tank requirements, the weight of the motor and its accessories, and, when carried, the wireless installation and searchlight with their accessories, shall be carefully considered in the calculation and allowance made for the extra buoyancy required for such weight.

59.32 Deck area of pontoon boats and open boats of the second class. (a) The area of the deck of a pontoon boat of type 1C, 2B, or 2C shall be determined by the method indicated below or by any other method giving the same degree of accuracy. The same rule is to be applied in determining the area within the fixed bulwarks of a boat of type 2A.

(b) For example, the surface in square feet of a boat may be deemed to be given by the following formula:

$$\text{Area} = \frac{l}{12} (2a + 1.5b + 4c + 1.5d + 2e)$$

l being the length in feet from the intersection of the outside of the planking with the stern to the corresponding point at the sternpost, a, b, c, d, e denote the horizontal breadths in feet outside the planking at the points obtained by dividing l into four equal parts and subdividing the foremost and aftermost parts into two equal parts (a and e being the breadths at the extreme subdivisions, c at the middle point of the length, and b and d at the intermediate points).

(c) The minimum cubic capacity of open boats of type 1A shall be not less than 10 cubic feet for each person.

(d) The minimum cubic capacity of open boats of type 2B shall be not less than 9 cubic feet for each person.

(e) The minimum deck capacity for open boats of type 2A and pontoon boats of type 2C shall be not less than 3¼ square feet, and of pontoon boats of types 2B and 1C not less than 3¼ square feet.

(f) If after a practical demonstration it is found that there is a greater seating capacity than is allowed by the above, the number of square feet may be reduced, but never less than 3 square feet for each person.

59.33 Capacity limits. (a) Pontoon boats and pontoon rafts shall never be marked with a number of persons greater than that obtained in the manner specified in this section. This number shall be reduced:

(1) When it is greater than the number of persons for which there is proper seating accommodation, the latter number being determined in such a way that the persons when seated do not interfere in any way with the use of the oars.

(2) When in the case of boats other than those of the first two sections of the first class, the freeboard, when the boat is fully loaded, is less than the freeboard laid down for each type respectively. In such circumstances the number shall be reduced until the freeboard, when the boat is fully loaded, is at least equal to the standard freeboard laid down above.

(b) In boats of types 1C and 2B the raised part of the deck at the sides may be regarded as affording seating accommodation.

59 34 Equivalents for and weight of the persons (a) In test for determining the number of persons which a boat or pontoon raft can accommodate each person shall be assumed to be an adult person wearing a life preserver.

(b) In verifications of freeboard the pontoon boats shall be loaded with a weight of at least 165 pounds for each adult person that the pontoon boat is authorized to carry.

(c) In all cases two children under 12 years of age shall be reckoned as one person.

59 35 Numbering and marking of lifeboats. (a) The number of each lifeboat shall be plainly marked or painted on each side of the bow in figures 3 inches high, and, where lifeboats are carried on both sides of a vessel, the odd-numbered boats shall be stowed on the starboard side and even-numbered boats on the portside, i. e., lifeboat No. 1 shall be forward on the starboard side, and lifeboat No. 3 next abaft lifeboat No. 1, lifeboat No. 2 shall be forward on the portside and lifeboat No. 4 next abaft lifeboat No. 2, etc. Where lifeboats are nested, the lifeboat under lifeboat No. 1 shall be numbered 1A, the lifeboat under lifeboat No. 2 shall be numbered 2A, etc.

(b) The cubical contents and number of persons allowed to be carried on each lifeboat shall be plainly marked or painted on each side of the bow in letters and numbers 1½ inches high. In addition, the number of persons allowed shall be plainly marked or painted on the top of at least two of the thwarts in letters and numbers 3 inches high. Such letters and numbers shall be dark on a light ground or light on a dark ground.

59 36 Lifeboats and life rafts kept clear for launching The decks on which lifeboats of any class or life rafts are carried shall be kept clear of freight or any other obstruction that would interfere with the immediate launching of the lifeboats or life rafts.

59 37 Blocks and falls Blocks and falls installed after January 1, 1942, shall conform to the following requirements:

All blocks, falls, fairleads, padeyes, fastenings, etc., used in connection with lifeboat gear shall be designed with a minimum factor of safety of 6, based on the maximum working load.

Where mechanical means for lowering are required, not more than two-part falls shall be used, except in specific cases where three-part falls may be accepted.

Wire rope falls of 6 x 19 regular lay filler wire construction, prelubricated at the factory with suitable neutral wire rope lubricant, shall be accepted as standard. Any other type of wire superior or equally as good as the minimum standard specified may be used.

Falls shall be of such length that the lifeboat may be lowered to the water at the lightest seagoing draft with the vessel listed to 15°.

All ocean and coastwise vessels and all other vessels of over 1,000 gross tons, not fitted with mechanical means for lowering, shall be provided with covered tubs, boxes or reels for stowage of falls and with suitable lowering bits in easily accessible positions, except that all ocean and coastwise self-propelled vessels of over 1,000 gross tons, not fitted with mechanical means for lowering, for which contracts for construction are let on or after September 2, 1945, shall be fitted with cruciform bits in such position as will render lowering practicable.

Where more than one lifeboat is served by the same set of davits; if the falls are of manila rope, separate falls shall be provided to serve each lifeboat.

Such blocks as are necessary to allow the falls to lead fair in all positions of the davit shall be fitted. Where mechanical means for lowering are provided, there shall be at least 8 feet between the center of the drum and the center of the nearest sheave. Sheaves for wire rope shall have a diameter at the base of the groove at least equal to 12 times the diameter of the rope.

There shall be ample clearance between the cheeks of blocks in which manila rope is used. The width between the cheeks shall be half an inch greater than the diameter of new ropes when those ropes are $3\frac{1}{4}$ inches in circumference or greater, blocks for smaller ropes shall be designed with clearance in the same proportion.

Means for lubrication shall be provided for all moving parts of blocks.

59 38 Care of lifeboats. Lifeboats shall be stripped, cleaned, thoroughly overhauled, and painted at least once in every year.

59 39 Tests of lifeboats at annual inspection. The inspectors shall satisfy themselves that every lifeboat, together with its equipment, of all vessels, is in every respect in good condition and ready for immediate use. Every lifeboat, with its required equipment, of passenger vessels, shall be lowered to near the water and loaded to its allowed capacity, evenly distributed throughout its length, and then lowered into the water afloat. In making this test, persons or deadweight may be used. If persons are used, the weight of each person shall average at least 140 pounds. When deadweight is used, the weight shall be equivalent to at least 140 pounds for each person allowed.

59 40 Size of boats. (a) No lifeboat for use on ocean steam vessels shall be of less than 180 cubic feet capacity, except that all pleasure steamers, and other steamers not exceeding 1,000 gross tons limited by their certificate of inspection to routes not exceeding 20 nautical miles offshore shall only be required to carry one lifeboat of 180 cubic feet capacity. Nothing, however, shall exempt such steamers from carrying the aggregate cubic capacity required by this part and Part 60. The minimum capacity of lifeboats for this class of vessels shall be 125 cubic feet.

(b) The Coast Guard District Commander may, in exceptional cases, permit lifeboats of less than 180 cubic feet as a substitute for said boat on steamers where the crew is insufficient to properly handle a boat of that size, or where there is lack of space to properly carry so large a lifeboat, but in every such case the steamer shall be provided with one or more lifeboats efficient in character and large enough to carry every person on board, and in no case shall the lifeboat be of less capacity than 125 cubic feet.

59 41 Handling of boats and rafts. All the boats and rafts shall be stowed in such a way that they can be launched in the shortest possible time and that, even under unfavorable conditions of list and trim from the point of view of the handling of the boats and rafts, it may be possible to embark in them as large a number of persons as possible. The arrangements shall be such that it may be possible to launch on either side of the vessel as large a number of boats and rafts as possible. Where practicable, lifeboat chocks shall be so fitted that the lifeboats they serve shall not require lifting before launching. At least once in each interval of not longer than 3 months, the master of every inspected passenger vessel shall drill and exercise every member of the crew, except females, in pulling oars in the ship's lifeboats. In addition, the crew of the motor-propelled boats shall demonstrate their ability in the working of the engine and handling of the boat under power.

59.42 Life rafts. Drawings, specifications, name plate, and how marked. (a) All life rafts shall be substantially constructed in accordance with drawings, or blueprints, and specifications approved by the Commandant.

(b) Builders of life rafts shall furnish the Coast Guard District Commander of the district in which the life rafts are built drawings, or blueprints, and specifications showing and explaining the construction of same and showing the tensile strength and ductility of the

metal used Life rafts may be constructed of steel having a minimum tensile strength not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches, or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved metals Where steel is used and a minimum thickness of the metal is less than No 16 B W G, the elongation shall not be less than 15 percent in a gage length of 8 inches

(c) Builders of life rafts shall affix a plate or other device to each life raft, having thereon the builder's name, the manufacturer for whom approved, number of raft, date of construction of raft, cubical contents of raft, and number of persons said raft will carry, as determined by the rules of the Commandant

(d) There shall be stenciled in a conspicuous place on each life raft now in use the number of persons said raft can carry, as hereinafter provided

59 43 Inspection of life rafts when built Coast Guard District Commanders of districts where life rafts are built shall detail an inspector to any place where life rafts are being built, whose duty it shall be to carefully inspect and examine the construction of such life rafts, and he shall satisfy himself that such life rafts are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders When the inspector approves the construction of the raft he shall stamp his initials, together with the letters U S C G, on a blank space on the plate required to be affixed to the raft by the builder The initials of the inspector shall be satisfactory evidence to all parties interested that the raft has been constructed in accordance with the drawings, or blueprints, and specification on file This section shall apply to all life rafts constructed after June 30, 1912

59 44 Construction of rafts of the catamaran type. All metal life-raft cylinders of more than 15 feet in length or of more than 16 inches in diameter shall be constructed of metal not less than No 18 B W G No life-raft cylinders shall be of less thickness of metal than No 20 B W G

The retaining bands which secure the cylinders to the frames shall be made in halves, so that the cylinders may be detached without difficulty and without disassembling the body of the raft, for the purpose of inspection, cleaning, and painting, as required by § 59 46 Wooden guards and gunwales shall be secured to the retaining bands by angle-iron clips or by the jaws of the retaining bands Iron rods extending across the raft at top and bottom shall pass through the gunwale and its securing clips or jaws at each end of the raft. The ends of the rods shall be properly secured with a screw nut inside and outside of the gunwale

All such cylinders shall be divided by watertight bulkheads into not less than three compartments of equal lengths Cylinders over 9 feet in length shall be divided into equal lengths by watertight bulkheads into not less than one compartment for every 3 feet of its length One of such bulkheads shall be at the extreme end of each cylinder or as near thereto as the flange of cone or bumped ends will permit Each compartment shall be provided with a suitable air-pump connection of one-half inch outside diameter, fitted with airtight cap.

Only countersunk-headed rivets shall be used in the construction of metallic life rafts

All seams and joints shall be properly double riveted or where welding is employed the welders shall be qualified by the Coast Guard

The above provisions of this section shall take effect only as to life rafts constructed after December 31, 1908

The circumferential as well as the longitudinal seams of life-raft cylinders shall be riveted and tightly calked, or securely hook-jointed and efficiently soldered, or properly and securely welded on rafts constructed after June 30, 1905 Such longitudinal seams shall be secured by not less than 12 rivets to each foot, circumferential seams by not less than 10 rivets to each foot, and bulkheads by not less than 8 rivets to each foot Bulkhead flanges may be single riveted The diameter of shank of rivets shall be not less than No 10 B W G

The framework connecting the cylinders of metallic life rafts shall be substantially built and capable of resisting the strain which tends to break the cylinders apart when the raft is broadside on in surf or seaway

59.45 Tests of air tanks of life rafts Before any life raft is passed and accepted the air tanks thereof shall be tested in the presence of an inspector by an air pressure of not more than 1 pound to the square inch. At each subsequent annual inspection, or oftener, if in the opinion of the inspectors it is necessary or desirable, the inspectors shall satisfy themselves that the tanks are in good condition, but pressure need not be applied unless the inspectors are in doubt regarding the efficiency of the tanks. This does not take from the inspectors the right and authority to satisfy themselves at any time, either by examination or pressure, as to the condition of the tanks

59.46 Care of life rafts All life rafts shall be stripped, cleaned, painted, and thoroughly overhauled at least once in every year, and inspectors shall carefully examine at all inspections the material which supports the platform of all life floats in order to determine to their satisfaction that the strength is maintained. If it is found that deterioration has begun it shall be corrected even to the extent of requiring the renewal of the platform-supporting device

59.47 Approved life rafts Any type of life rafts approved by the Commandant shall be considered as equivalent to the standard raft above specified

59.50 Capacity and allowance of life rafts (a) No type of raft may be approved unless it satisfies the following conditions

(1) It should be reversible and fitted with bulwarks of wood, canvas, or other suitable material on both sides. These bulwarks may be collapsible and shall be not less than 4 inches high

(2) It should be of such size, strength, and weight that it can be handled without mechanical appliances, and, if necessary, be thrown from the vessel's deck

(3) It should have not less than 3 cubic feet of air cases or equivalent buoyancy for each person whom it can accommodate

(4) It should have a deck area of not less than 4 square feet for each person whom it can accommodate, and the platform should be not less than 6 inches above the water level when the raft is loaded

(5) The air tanks or equivalent buoyancy should be placed as near as possible to the sides of the raft

(b) Rafts shall never be allowed a greater number of persons than for whom there is proper seating capacity without interfering with the use of the oars. At least one-half of the number of life rafts on all steam vessels shall each have a capacity exceeding 15 persons. Tule and all other types of life rafts shall meet the requirements herein specified

59.52 Equipment for life rafts Life rafts shall be equipped as follows

(a) **Distress signals** Twelve approved hand red flare distress signals in a watertight container, and 4 approved floating orange smoke distress signals, or 12 approved hand combination flare and smoke distress signals in a watertight container. Service use shall be limited to a period of 3 years from date of manufacture. Distress signals not bearing date of manufacture shall not be carried after January 1, 1949. (For specifications for the above signals, see subparts 160.021, 160.022, and 160.023 in Subchapter Q of this chapter.)

NOTE—The specifications for distress signals are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the manufacture of equipment, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows

160.021 Signals, Distress, Flare, Red, Hand (46 CFR subpart 160.021)

160.022 Signals, Distress, Smoke, Orange, Floating (46 CFR subpart 160.022)

160.023 Signals, Distress, Combination Flare and Smoke, Hand (46 CFR subpart 160.023)

- (b) **Drinking cups** Two enameled drinking cups
- (c) **Life line.** One life line properly secured entirely around the sides and ends of the raft, festooned to the gunwales in bights not longer than 3 feet with seine float in each bight
- (d) **Matches** One box of friction matches in a watertight container
- (e) **Oars** Four oars
- (f) **Painter.** One painter of manila rope not less than 2¾ inches in circumference and a length not less than three times the distance between the boat deck and the light draft
- (g) **Provisions** Two pounds of provisions for each person consisting of hard bread or its equivalent in any approved emergency ration of cereal or vegetable compound packaged in hermetically sealed containers of an approved type and stowed in provision lockers or other compartments providing suitable protection. No meat or other ration requiring a saline preservative shall be allowed
- (h) **Rowlocks** Five rowlocks attached by separate chains
- (i) **Sea anchor.** One sea anchor constructed of good quality canvas or other satisfactory material, and, if of circular pattern, shall be not less than 2 feet in diameter
- (j) **Self-igniting water light.** One self-igniting water light of approved type
- (k) **Storm oil** One container holding 1 gallon of vegetable or animal oil so constructed that the oil can be easily distributed on the water, and so arranged that it can be attached to the sea anchor
- (l) **Drinking water** For each person at least 1 quart of drinking water contained in hermetically sealed cans of an approved type and stowed in the drinking water tanks, lockers, or other compartments providing suitable protection
- (m) **Boathook** One boathook of clear-grain white ash not less than 8 feet long by 1½ inches in diameter, with a sharp hook and prong
- (n) (Canceled)
- (o) **Signaling mirrors** Two signaling mirrors of an approved type

59.53 Certificated lifeboatmen, manning of boats There shall be for each boat or life raft a number of lifeboatmen at least equal to that specified in the following table

If the prescribed complement is—	The minimum number of certificated lifeboatmen shall be—
Less than 41 persons.....	2
From 41 to 61 persons.....	3
From 62 to 85 persons.....	4
Above 85 persons.....	5

The allocation of the certificated lifeboatmen to each boat and raft remains within the discretion of the master, according to the circumstances

59.54 Manning of the boats. (a) A licensed deck officer or a certificated lifeboatman shall be placed in charge of each boat or life raft by the master, and a second in command shall also be nominated by the master. The person in charge shall have a list of its crew, and shall see that the men placed under his orders are acquainted with their several duties

(b) A man capable of working the motor shall be assigned to each motorboat by the master

(c) A man capable of working the wireless and searchlight installations shall be assigned to boats carrying this equipment by the master

(d) The duty of seeing that the lifeboats, life rafts, and buoyant apparatus and other lifesaving apparatus are at all times ready for use shall be assigned to one or more officers

59.54a Buoyant apparatus—(a) Definition. Buoyant apparatus is defined as buoyant deck seats, buoyant deck chairs, and life floats or other apparatus, having buoyancy except lifeboats, life buoys, and life preservers, and no buoyant apparatus shall be approved which requires any adjustment or preparation

(b) General requirements Buoyant apparatus shall conform to the following general requirements

(1) Its construction shall be of material and workmanship adequate for the purpose intended

(2) It shall be effective and stable floating either side up

(3) It shall have a line securely becketed around the outside and/or pendants to accommodate the number of persons allowed

(4) It shall be of such size, strength, and weight as to be handled without mechanical appliances and thrown without damage from the deck where stowed

(5) Its weight shall in no case exceed 200 pounds

(6) It shall have air cases or equivalent buoyancy placed as near as possible to its sides

(c) Capacity (1) The number of persons for which any type of buoyant apparatus may be deemed suitable shall be determined, subject to the result of the stability test by the least of the numbers ascertained, as follows (i) Number of pounds of iron the apparatus is capable of supporting in fresh water, divided by 32, (ii) the number of feet in the perimeter

(2) The divisor given in subparagraph (1) shall be required to be increased where the apparatus is designed so that persons supported are only partially immersed in the water, or where facilities are provided for climbing onto the top of it

(d) Stability Every type of buoyant apparatus shall be capable of supporting along any edge, without capsizing, a weight of iron 15 pounds per foot length suspended in the water from the life lines. Where the length of the edge is 4 feet or less the minimum weight of iron suspended from any edge shall be 60 pounds

(e) Test for strength Every new type of buoyant apparatus shall be tested for strength by dropping a sample into the water from a height of 60 feet

(f) Air tanks—(1) Material Where metal air tanks furnish the buoyancy of the apparatus, they shall be constructed of best-quality copper or yellow metal of not less than 18 ounces to the superficial foot. All joints shall be securely hook-jointed and efficiently soldered, or properly and securely welded. Air tanks shall be fitted with suitable testing nipples, and when testing same an air pressure of not more than 1 pound to the square inch shall be used

(2) Size Air tanks shall be not more than 4 feet in length, but where more than 2 feet 6 inches in length or breadth they shall be efficiently stiffened by divisions or stays. At no time shall the cases be pierced for the attachment of wood divisions or stays, nor for any other purpose

(3) Protection Air tanks shall not be placed in contact with metal ironwork, and they shall be protected from injury by properly fitted solid wood casing and secured against movement therein

(g) Name plate Each piece of buoyant apparatus shall have a brass plate or its equivalent affixed thereon by the builder, and bearing his name and address, the words "Buoyant apparatus," the number of the apparatus, date of construction, dimensions and number of persons allowed

(h) Factory inspection Buoyant apparatus shall be examined at the factory by an inspector, who shall satisfy himself that it has been constructed in accordance with plans and specifications on file in the office of the Coast Guard District Commander, after which he shall stamp the initials of his name, the letters U, S, C, G, and the date on the name plate.

59 54b Equipment for buoyant apparatus Buoyant apparatus designed to accommodate 25 persons or more shall be fitted and equipped as follows

(a) Life line One life line properly secured entirely around the sides and ends of the buoyant apparatus, festooned to the gunwales in bights not longer than 3 feet with some float in each bight

(b) **Painter** One painter of sufficient strength properly secured to the buoyant apparatus so that the buoyant apparatus may be lowered from the deck where stowed to the water. It shall be of good quality manila rope not less than 2 inches in circumference and at least equal in length to the height of the boat deck where stowed to the vessel's light seagoing draft plus 6 feet.

(c) **Self-igniting water light** One self-igniting water light of approved type.

(d) **Exceptions** Buoyant apparatus designed to accommodate less than 25 persons shall not be required to be equipped with a self-igniting water light. Such apparatus weighing less than 75 pounds shall not be required to have a painter for lowering.

59 55 Life preservers—(a) Number required All vessels shall be provided with one approved life preserver for each person carried. Passenger vessels shall be provided with an additional number suitable for children equal to at least 10 percent of the total number of persons carried.

(b) **Distribution, stowage, and notices** (1) Life preservers, including those especially provided for children, shall be properly distributed throughout the staterooms, berthings, and other places convenient for passengers and crew.

(2) Lockers, boxes, and closets in which life preservers are stowed shall be plainly marked, and the life preservers contained therein shall be readily available.

(3) Life preservers stowed overhead shall be so supported that they can be quickly released and distributed among passengers. Where life preservers are stowed overhead at a height greater than 7 feet from the deck below, efficient means shall be provided for their immediate release and distribution, to be operated by persons standing on the deck.

(4) A printed notice shall be posted in every cabin and stateroom and in conspicuous places about the deck, informing passengers of the location of the life preservers and describing and illustrating the method of applying or adjusting them.

(e) (Canceled.)

NOTE—The specifications for buoyant materials have been revised and transferred to Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations. These specifications have not been reprinted herein but may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows:

164 001 Cork, Sheet (46 CFR subpart 164 001)

164 002 Balsa Wood (46 CFR subpart 164 002)

164 003 Kapok, Processed (46 CFR subpart 164 003)

(f) **Specifications for standard type block-cork life preserver—(1) Type** The type shall conform to figure 1, and shall be reversible and vestlike, with recesses under arms to allow front and back sections to fit around the upper part of the wearer and held in place by straps, the whole to be of such construction and character as to support the wearer in an upright or slightly backward position. Children's life preservers are to be of the same general form and construction and conform in every respect, as regards material and design, to the standard approved adult life preserver with the exception that the size is to be reduced one-third.

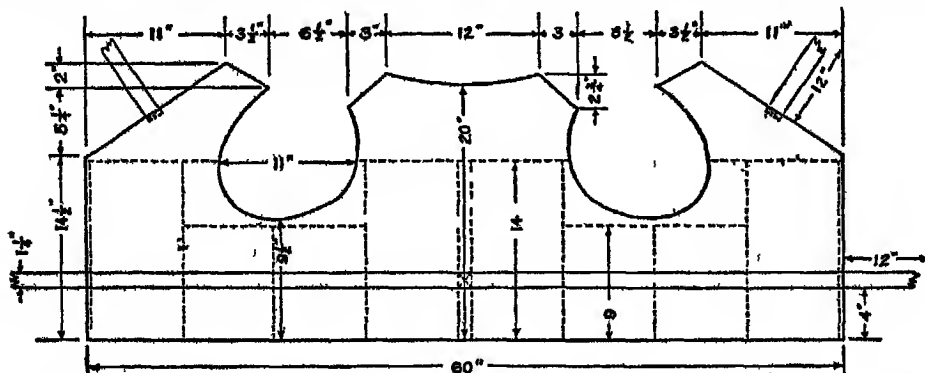


FIGURE 1.—Approximate dimensions of a standard type cork and balsa wood life preserver cutting pattern. Dotted lines indicate stitching.

(2) **Buoyant material** It shall contain eight blocks of cork of the following approximate dimensions 4 blocks 11" x 5" x 1½" and 4 blocks 6" x 5" x 1½" The corners and edges of the blocks shall be slightly rounded or beveled The weight of the finished cork in each life preserver shall be not less than 4 pounds and not more than 4 5 pounds

(3) **Buoyancy test** The life preserver shall be submerged in a tank of fresh water for a period of 48 hours The adult life preserver shall then support in fresh water a net weight of 16½ pounds or 11 pounds for children's type

(4) **Cover** The cover shall be of unbleached, uncolored drill or twill, without filling or sizing, weighing not less than 7 2 ounces to the square yard It shall be in not more than two pieces, one piece for either side

(5) **Marking** Each life preserver shall be plainly marked on the front compartment with either the word "Adults" or the word "Children" as the case may be It shall also be plainly stenciled with the name and address of the manufacturer and with the official approval number assigned to the life preserver

(6) **Smooth surface** The outside surface, edges, and corners of the buoyant material shall be of such smoothness as will prevent undue destruction of the covering material and present a suitable smooth surface for legible stenciling and stamping by inspectors

(7) **Stitching** All seams and other machine sewing shall be made with a short lock stitch with not less than eight stitches to the inch The lower longitudinal edge of the covering seam shall be turned to a roll and closely rope stitched or it may be machine sewn with a short lock stitch with not less than 8 stitches to the inch

(8) **Straps** The straps shall have a tensile strength of at least 175 pounds and shall be of double-woven cotton tape 1½ inches in width having selvedge or cord edges One strap on each side secured by double stitching and extending 12 inches beyond the end of the life preserver, and two neck straps 12 inches in length All straps are to be sewn to the body of the life preserver by double stitching

(9) **Thread.** The thread shall be of a size and strength not less than Barbour's linen, three-cord, No 25 machine thread Any thread other than of linen shall require the approval of the Commandant

(g) **Specifications for standard type balsa-wood life preserver—(1) Type.** This shall be the same as for cork as provided in § 59 55 (f) (1)

(2) **Buoyant material** It shall contain eight blocks of balsa wood of the following approximate dimensions 4 blocks 11" x 5" x 1½" and 4 blocks 6" x 5" x 1½" The corners or edges of the blocks shall be slightly rounded or beveled The weight of the finished balsa wood used in each life preserver shall not be less than 2½ pounds not more than 3 pounds

(3) **Buoyancy test.** This shall be the same as provided in § 59 55 (f) (3)

(4) **Cover** This shall be the same as provided in § 59 55 (f) (4)

(5) **Marking** This shall be the same as provided in § 59 55 (f) (5)

(6) **Smooth surface** This shall be the same as provided in § 59 55 (f) (6)

(7) **Stitching** This shall be the same as provided in § 59 55 (f) (7)

(8) **Straps** This shall be the same as provided in § 59 55 (f) (8)

(9) **Thread** This shall be the same as provided in § 59 55 (f) (9)

(h) (Canceled)

NOTE—The specifications for kapok life preservers are published in a separate pamphlet, which may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D. C

(i) **Factory inspection.** An inspector shall examine all life preservers at the place of manufacture After satisfying himself that they have been manufactured according to the requirements of these rules, he shall select indiscriminately from each lot of 250 at least one life preserver to be tested for buoyancy

Where such life preservers are found to conform to all the requirements of these rules, the inspector shall stamp them with the word "Approved," the initials of his name, the date of examination, and location of his local office

(j) **Shipboard inspections** At each annual inspection of any vessel, or oftener if deemed necessary, the life preservers shall be examined by an inspector to determine serviceability. When life preservers are found to be in accordance with the requirements, the inspector shall stamp them with the word "Passed", his initials, port, and date. Life preservers found not to be in a serviceable condition shall be removed from the vessel's equipment and, if beyond repair, shall be destroyed in the presence of the inspector.

(k) **Manufacturer's affidavit**

AFFIDAVIT OF MANUFACTURE OF STANDARD TYPE LIFE PRESERVERS

State of _____, County of _____
 _____ on this _____ day of _____, 19____, I, the undersigned, _____ hereby certify that I am the _____
 _____ (Name) _____ (Title)
 _____ of the _____ located at _____
 _____ (Name of company)
 _____, that I am authorized to make this affidavit, and that the standard type _____ life preservers of our manufacture furnished directly or through
 _____ (See Note 1)
 agents or dealers for use on vessels subject to the jurisdiction of the United States Coast Guard, comply with the applicable provisions of the regulations prescribed.

(Signature) _____

Subscribed and _____ to before me this _____ day of _____,
 19____ (Sworn or affirmed)

(Signature) _____

[SEAL]

Notary Public

Note 1.—Indicate adult or child size and name or description of buoyant material

59 56 Life buoys—(a) Number required (1) The minimum number of approved 30-inch life buoys and the minimum number to which approved water lights shall be attached shall be in accordance with the following table

Length of vessel	Minimum number of approved 30 inch life buoys	Minimum number of approved 30-inch life buoys with approved water lights attached
Under 200 feet	8	6
200 feet and under 400 feet	12	6
400 feet and under 600 feet	18	9
600 feet and under 800 feet	24	12
800 feet and over	30	15

(2) One life buoy on each side of a vessel shall have an attached line at least 15 fathoms in length.

(b) **Distribution and securing of life buoys and water lights** All life buoys and water lights shall be distributed and secured as follows

(1) All life buoys shall be so placed as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to the persons concerned.

(2) The life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way.

NOTE—The specifications for life buoys are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the manufacture of ring buoys, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows:

160 009 Buoys, Life, Ring, Cork and Balsa Wood (46 CFR subpart 160 009)

164 001 Cork, Sheet (46 CFR subpart 164 001)

164 002 Balsa Wood (46 CFR subpart 164 002)

59 57 Self-igniting water lights The self-igniting water lights for ring buoys and life rafts shall consist of a cylinder (with bumped heads or ends) made of good sheet copper of not less than 0.022 inch thick, and shall be so designed as to be nonexplosive, and shall be free from any defects which may affect the serviceability or operation of the light. The cylinder shall be sufficiently weighted in the bottom to recover and maintain an upright position in the water, and all circumferential and horizontal seams of the cylinder shall be hook-jointed and soldered, and the top circumferential seam shall be flush, so as to prevent the lodgment of water.

The cylinder shall be provided with a plug or other device of such character that when removed from the cylinder sufficient water will be admitted to insure the prompt and efficient action of the light, regardless of whether the cylinder when first striking the water becomes completely submerged.

The removal of the plug or device shall be effected by the operation of a lanyard attached to the buoy and to the plug or device on the cylinder, and shall be so arranged and constructed that the weight of the buoy when thrown overboard will automatically disengage the plug or device, and will insure that the light will self-ignite within one minute after reaching the surface of the water.

The cylinder shall contain calcium carbide (taken from fresh stock entirely free from the white powdery substance resulting from exposure to the air) and calcium phosphide sufficient to create a brilliant flame of at least 150 candlepower, which shall be maintained and burn for a continuous period of not less than 45 minutes without emitting obnoxious fumes. If at any time during this period the flame is extinguished, due to the total submersion of the light, the light shall self-ignite upon coming to the surface.

The self-igniting water lights required for life rafts shall meet the requirements of this section except that the plug or device may be removed by manual action instead of by automatic action of the buoy lanyard above referred to.

The cylinder shall be plainly marked with the word "Top" at its top end and permanently indented or embossed with the name and address of the manufacturer, the year of manufacture (the use of labels of any description for this purpose is strictly forbidden), and with the statement that the device meets in every way the requirements of the Commandant.

On and after July 1, 1924, no type or make of water light will be approved which has not been tested by the Bureau of Standards, Department of Commerce, and found to conform in all respects to the requirements in this part.

59 60 Line-carrying guns and equipment All ocean vessels shall be equipped with a line-carrying gun and equipment auxiliary thereto, as specified in this part.

59 61 Line-throwing appliances—(a) Types (1) Vessels of 300 gross tons and over shall be equipped with a mounted-type gun, either breech or muzzle loading, similar in size, performance, and general design to the guns used by the Coast Guard.

(2) Vessels under 300 gross tons may use the so-called "shoulder gun," the requirements of which are set forth in a subsequent section under that heading.

(b) Muzzle-loading guns (1) The muzzle-loading gun shall not weigh over 200 pounds. The gun shall be provided with means allowing easy mounting and dismounting.

the barrel from the carriage. The gun shall be provided with means allowing the barrel to be fixed at various elevations up to 35 degrees. A mechanical firing attachment of an approved type shall be provided on all guns manufactured on and after April 1, 1944. On or before July 1, 1945, all guns shall be fitted with approved mechanical firing attachments.

(2) The barrel shall be of steel or bronze not less than 20 inches long and have a $2\frac{1}{2}$ -inch smooth bore. It may be cast, forged, or otherwise acceptably formed. The use of core supporting pins extending into the wall of the gun during casting is not permitted. The barrel shall be mounted on a carriage by the use of trunnions or other suitable means.

(3) The carriage may be of wood or of steel. If of wood, the recesses which receive the trunnion pins or other barrel supporting means shall be metal lined. The carriage shall be provided with means for securing the gun against movement during firing.

NOTE—Approved muzzle-loading guns manufactured prior to April 1, 1944, and fitted with friction primer firing devices may be continued in use until July 1, 1945, if in serviceable condition but all replacement units shall be fitted with approved mechanical firing attachments.

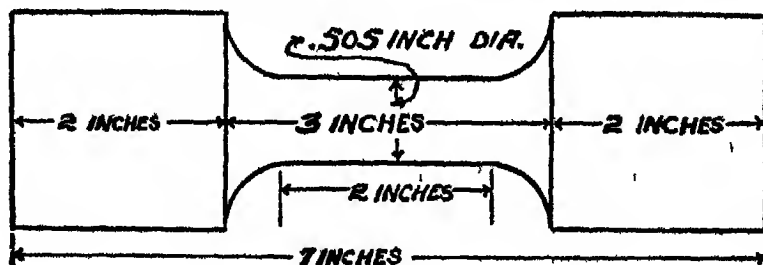
(c) Breech-loading guns (1) The breech-loading type of gun shall be of the materials specified for the muzzle-loading type. It shall also approximate the dimensions and weight required for the muzzle-loading gun and shall be smooth bored. It shall be equipped with suitable breech closing and locking devices, capable of withstanding pressures of 23,500 pounds per square inch. A breech-loading gun must incorporate in its design a suitable gas-checking device to prevent the escape of gas to the rear.

(2) The mount shall be of the slide and carriage type and shall be provided with a suitable recoil-checking mechanism. The slide shall include a means of carrying or mounting the gun so as to permit recoil and the recoil-checking mechanism. It shall be fitted with trunnions which shall rest in the trunnion seats of the carriage so as to permit the gun and slide to be elevated up to 35°. The carriage shall be a U- or a Y-shaped casting having at its base a pivot which will fit in a rail socket or socket stand, thus permitting motion of the gun, slide, and carriage in tram. It shall afford suitable trunnion seats fitted with cap squares and bolts. There shall be incorporated in this type of mount efficient means for securing the gun in elevation and tram.

(d) Material used in guns (1) Material used in the construction of bronze guns shall have a tensile strength of not less than 65,000 pounds per square inch with an elongation of not less than 20 percent in 2 inches and a reduction of area not less than 25 percent.

(2) Material used in the construction of steel guns shall have a tensile strength of not less than 65,000 pounds per square inch with an elongation of not less than 20 percent in a length of 2 inches.

(3) The manufacturer shall furnish the Coast Guard District Commander in whose district the gun is tested a sample of the material used in its construction, accompanied by an affidavit that the specimen submitted actually and correctly represents the material used. The sample shall be distinctly marked with the number appearing on the gun it represents, and shall conform to the dimensions as shown in the diagram following.



(e) **Line-carrying gun equipment**—(1) **Service projectiles** Six service projectiles shall be supplied with each gun. These projectiles shall weigh not less than 17 pounds nor more than 18 pounds each. They shall be smoothly turned and finished and shall have a windage of not more than 0.015 nor less than 0.002 of an inch. The upper end shall carry an eyebolt or shank of sufficient length to project slightly beyond the muzzle. This eyebolt or shank shall afford an eye for securing the line. Projectiles shall be of such character as to be readily withdrawn from the gun whenever necessary or desirable.

(2) **Service lines** Four service projectile lines shall be supplied with each gun, and shall be not less than seven-thirty-seconds of an inch nor more than nine-thirty-seconds of an inch in diameter, and at least 1,700 feet long. They shall conform to the following requirements:

(i) They shall be either 3-strand, soft-laid best quality flax or regularly laid best quality manila. Each line shall be in one continuous length without splice, knot or other retarding or weakening feature and have a breaking strain of not less than 500 pounds.

(ii) The end of the line intended to be attached to the projectile shall have securely attached thereto a substantial tag bearing a permanent legend indicating its purpose, the other end of the line shall be tagged in the same manner to prevent delay in securing proper and immediate action with the equipment.

(iii) Each line shall be coiled, faked, or reeled in its own faking box or reel in such manner that when all the line leaves the container it shall automatically become unattached and free from the container.

(3) **Line container** The faking box or reel shall be of such size as to accommodate the size and type of line used. The faking box shall have a frame slightly larger than the box with a row of wooden pins set vertically into its four sides. It shall have a false bottom which shall be a tablet of wood pierced with holes corresponding to the pins and shall fit down over the pins until it reaches their base and rests on the frame. The frame shall be equipped with proper hooks for securing it to the box after the line has been faked on the pins. The reel type container shall consist of a reel upon which the line may be readily coiled and a canister or container into which the coiled line may be placed which will afford a fair lead through which the line may pay out. The reel must be so designed as to permit easy withdrawal after the line has been coiled.

(4) **Statement of manufacturer** The container of the line shall bear the name of the manufacturer and a statement to the effect that in all respects the line meets the requirements specified in paragraph (e) (2), for service lines.

(5) **Primers** Primers used with breech-loading guns shall be of the percussion type. Primers used with the muzzle-loading gun shall be of the friction or percussion type. All muzzle-loading guns constructed on and after April 1, 1944, shall be provided with an approved mechanical firing attachment. On or before July 1, 1945, all muzzle-loading guns shall be provided with approved mechanical firing attachments. At least 25 primers shall be carried at all times.

(6) **Auxiliary line.** At least 1,500 feet of 3-inch manila line shall be carried by vessels of over 300 gross tons. This line shall be considered as part of the line-carrying gun equipment, and shall be maintained in first-class condition at all times.

(7) **Accessibility** The line-carrying gun and its equipment shall be kept always easily and immediately accessible and ready for use. No part of this equipment shall be used for any other purpose.

(f) **Factory tests**—(1) **Tests and approval** A mounted line-carrying gun shall be tested in the presence of the Coast Guard District Commander by firing three rounds from the gun. At least one round shall carry the regular service projectile with one of the service

lines attached for a distance of at least 1,050 feet without breaking or fouling the line, under conditions of a reasonably still atmosphere. The other rounds shall be fired with not less than the same weight powder charge used in the above test, and one shall be fired with not less than an 8-ounce charge. The projectiles used for these shots shall be of the same weight as the service projectile, but no line need be attached. Test shots shall be fired from the gun when mounted on its own carriage, lashed as in shipboard use. After the test has been satisfactorily completed, the gun and carriage shall show no signs of fracture or damage.

(2) Marking of gun and equipment and filing report. The mounted-type, line-carrying gun and its equipment, i. e., carriage, line box, or reel and projectiles shall all bear the same number and be initialed by the inspector who observes the test. He shall file a report of the test, together with the number of the gun, the date, and the result, in the office of the Coast Guard District Commander in whose district the test is made, and the Coast Guard District Commander shall furnish the manufacturer a copy of the report.

(g) Shoulder gun—(1) Where allowed. Vessels of 300 gross tons and under may use the shoulder gun as a means of propelling a line-carrying projectile.

(2) Type. The shoulder line-carrying gun shall be a breech-loading gun of 0.45 or 0.50 caliber, chambered for blank rifle cartridges, smooth bored and properly stocked. It shall be contained in a suitable case, together with the following equipment: 3 shot lines, 10 projectiles, 25 cartridges, 1 cleaning rod, 1 can of oil, and 1 book of instructions, and conform to the following requirements:

(i) The projectiles shall be machined from steel or bronze, weigh about 8 ounces, and have a shank of sufficient length to project slightly beyond the muzzle. The shank shall be made in one with the projectile and have at its upper end an eye for securing the line.

(ii) The line shall be at least 400 feet in length and have a circumference of about three-eighths of an inch. It shall be woven, or laid up, of cotton or flax and be very flexible, and have a breaking strain of not less than 250 pounds. It shall be made up, or coiled in such way as to render it ready at all times for immediate use, the coil or other device to permit the free running of the line when the gun is fired.

(3) Auxiliary line. At least 500 feet of 3-inch manila line shall be carried as an auxiliary line for use with the shoulder line-carrying equipment. This line shall be considered as part of the shoulder-gun, line-carrying equipment and maintained in first-class condition at all times.

(4) Accessibility. The shoulder-gun, line-carrying equipment shall be kept always easily and immediately accessible and ready for use and no part of this equipment shall be used for any other purpose.

(5) Test. The projectile shall be thrown, under conditions of a reasonably still atmosphere, for a distance of not less than 250 feet without fouling or breaking the line.

(h) Service recommendations—(1) Mounted type. The following precautions and procedure are recommended for the use of mounted-type, line-carrying guns and equipment:

(i) Service powder charge should be about 5 ounces, and the powder bags should be furnished to the vessel containing not more than that quantity of black powder. Under extraordinary circumstances, 8 ounces may be used.

(ii) In making the line fast to the shank, pass it through the eye and take three or more half-hitches around its own part, leaving a loop of about 10 or 12 inches and taking the hitches about 6 inches apart. This will allow the line to slip slightly through the eye of the shank before the hitches fetch up, thus easing the strain on the line at the loop during the initial acceleration.

(iii) A considerable bight lead over the side is recommended wherever possible, as it will tend to lessen the jerk on the line at initial acceleration.

(iv) At least a fathom of the line from the shank should be thoroughly wet before using to prevent burning.

(v) The faking box or reel should always be faced in the direction of the line of fire and placed abreast of the gun and as close to the ship's side as possible. It is not advisable to place the line too close to the muzzle of the gun, as the concussion may lift several layers or coils from the top, causing a snarl which in turn may cause the line to part.

(vi) Care should be taken in placing the equipment to prevent fouling of the line in rigging, ridge ropes, etc., which have a tendency to rise or jump up when the gun is fired.

(vii) Having made the gun and equipment ready for use, the following procedure in firing is recommended:

Select a place where the gun may recoil without striking anything, or where it may be securely lashed down.

Note the position of the vessel to be relieved, her distance, and the direction and approximate force of the wind, and then place the gun in position, making allowance for the drift of the line. Place the line on the windward side of the gun and about 3 feet from it.

Make the line fast in the eye of the shank and insert the powder charge, projectile, and primer. In loading, make sure that the projectile is seated against the powder charge.

(viii) After using, the lines should be thoroughly dried before rewinding or faking.

(2) **Shoulder type** In using the shoulder, line-throwing-type gun, the following precautions should be observed:

(i) Care should be taken to prevent fouling of the line in rigging, ridge ropes, etc., which have a tendency to rise or jump up when the gun is fired.

(ii) The projectile should be seated in the end of the cartridge case.

(iii) If fired near the ship's side, the gun must be held firmly to prevent it from "jumping" overboard.

(iv) The line should be wet thoroughly for 2 or 3 feet from the shank to prevent burning.

(v) The use of a "reduced load" cartridge is recommended, containing 50 grains of powder instead of 70.

(vi) After using, the line should be thoroughly dried before rewinding or faking.

(vii) In using this equipment the instructions furnished by the manufacturer shall be followed.

(i) **Drills.** The master of a vessel equipped with a line-carrying gun shall drill his crew in its use and require it to be fired at least once in every 3 months, using one-half the usual charge of powder and any ordinary line of proper length. The service line shall not be used for drill purposes. Each drill shall be recorded in the ship's log book.

(j) **Placard instructions.** A placard with instructions for using the gun apparatus, as practiced by the Coast Guard, shall be posted in the pilothouse and engine room, and seamen's, firemen's and stewards' departments of every vessel required by law to carry such gun apparatus.

59 62 Steering apparatus—(a) Extra steering apparatus consisting of relieving tackle, or of auxiliary power or hand steering gear attached to the rudder stock independent of the regular steering gear shall be provided.

(b) Where reasonable and practicable, the emergency steering wheel shall be located on the after weather deck, and an efficient means of communication shall be provided between the pilothouse, the emergency steering station, and the steering engine room.

(c) The following requirements relative to the arrangement of steering stations are applicable to new installations and replacements of existing installations on all classes of vessels:

(1) Steering wheels in or at steering stations shall be installed in a vertical position and arranged for steering by the helmsman when standing abaft the wheel and facing forward.

The top of the steering wheel, the rudder blades, and the head of the ship shall move in the same direction

(2) When a "trick" wheel is installed in the steering gear room and is used for warming up and testing the gear, and also for steering purposes, this wheel shall be arranged as follows

(1) If the "trick" wheel is installed in a vertical position it shall meet all requirements outlined in subparagraph 1

(u) If the "trick" wheel is installed in a horizontal position it shall turn in a clockwise direction for "right rudder" and in a counterclockwise direction for "left rudder" With this arrangement, the helmsman need not stand abaft the wheel

(3) Where "trick" wheel or other device is installed in the steering gear room for the sole purpose of warming up and testing the gear, it may be installed to best suit design and operating conditions of the gear A plate shall be fitted on this wheel or device with indicating arrows showing the direction of movement to produce "right rudder" and "left rudder"

(4) When auxiliary steering gear is installed in lieu of relieving tackles, the steering wheel or device used for operating the gear shall meet all requirements outlined in paragraph (c) (1) of this section

(5) At all steering stations, there shall be installed a suitable notice on the wheel or device, or in such other position as to be directly in the helmsman's line of vision, to indicate the direction in which the wheel or device must be turned for "right rudder" and for "left rudder"

(d) Where no regular rudder is fitted and steering action is obtained by a change of setting of the propeller unit, the requirements of paragraphs (a), (b) and (c) of this section will not generally be applicable, and special consideration will be given

59.63 Embarkation aids—(a) Ladders Vessels carrying passengers shall be provided with suitable ladders to enable passengers to descend to lifeboats and life rafts, one such ladder being provided for each set of boat davits These ladders shall be kept ready and convenient for use on the lifeboat deck, and shall reach from such deck to the vessel's light water line They shall be reversible and free from garment-entangling projections Effective May 30, 1943, at least one flexible ladder of an approved type shall be carried for embarkation and pilot's use On and after June 30, 1943, all new installations or replacements of flexible ladders shall be of an approved type

(b) Illumination for boat-launching operations (1) Provision shall be made on all passenger vessels, where the boat deck is more than 30 feet above the water line at the lightest seagoing draft, for readily and continuously available illumination from the vessel of lifeboats when along side and in process of or immediately after being launched There shall be a self-contained source capable of supplying, when necessary, this safety lighting system and placed in the upper part of the vessel above the bulkhead deck

(2) The emergency generating set will ordinarily provide a satisfactory source of illumination, and, where used for this purpose, it shall be of sufficient power to provide for such illumination in addition to other demands made upon the set

59.64 Bulkheads on passenger vessels less than 100 gross tons. (a) Every mechanically propelled vessel carrying passengers for hire shall have not less than three watertight transverse bulkheads properly secured to the hull of the vessel The arrangement of the bulkheads shall be such that the vessel will remain afloat in the event any one main compartment is flooded (Effective on and after January 1, 1943)

(b) A forepeak or collision bulkhead shall be fitted and located not less than 5 percent of the length of the vessel, and not more than 10 feet plus 5 percent of the length of the vessel from the bow, at load water line.

(c) One bulkhead shall be fitted at the forward end of the machinery space (which includes boiler space) and one bulkhead shall be fitted at the aft end of the machinery space

Other transverse bulkheads shall be so located as to meet the above requirements of subdivision and stability

(d) Main transverse bulkheads may be stepped or recessed. Where a main transverse bulkhead is stepped, subdivision and strength are to be provided in way of the step to maintain the same measure of safety as that secured by the vertical bulkhead. No recess shall be fitted nearer the vessel's side than one-fifth of the vessel's beam amidships measured at right angles to the center line at the level of the load water line on which the subdivision is based. Bulkheads shall extend to a deck whose distance above the load water line is sufficient to enable the subdivision and stability requirements to be met with a fair margin of safety.

(e) If the distance between two adjacent main transverse watertight bulkheads is less than 10 feet plus 2 percent of the vessel's length measured between perpendiculars at the extremities of the vessel's load water line, only one of these bulkheads shall be regarded as forming a boundary of a main compartment.

(f) Existing vessels shall comply with the above rules unless it can be shown by the owners that their application is impracticable and unreasonable.

59 64a Bulkheads on passenger vessels 100 gross tons and over. See Part 144, Subchapter M (Construction or Material Alteration of Passenger Vessels of the United States of 100 Gross Tons and Over Propelled by Machinery), of this chapter.

59 65 Means of escape from steamers. On all steamers where the plans and arrangements will possibly permit, all inclosures where passengers or crews may be quartered, or where anyone may be employed, shall be provided with not less than two avenues of escape, so located that if one of such avenues is not available another may be.

Every steam vessel shall be provided with sufficient means of escape from the lower to the upper deck, or vice versa, and every steamer of 50 tons or over carrying passengers shall be provided with permanent stairways forward and aft, except where said stairways on towing boats would interfere with towing bits.

Airports 16 inches or more in diameter in the hull of all passenger vessels that open into the passageways shall have a life line securely fastened overhead within the passageway. This life line shall be not less than 2 inches in circumference, knotted every 3 feet and of sufficient length to reach the water at the highest seagoing draft.

59 67 Vessel's name on equipment. All the equipments of a vessel, such as buckets, hose, axes, boats, oars, rafts, life preservers, floats, barrels, and tanks, shall be painted or branded with the name of the vessel upon which they are used.

59 68 Disengaging apparatus. Lifeboats shall be fitted with suitable disengaging apparatus. Mechanical disengaging apparatus shall be of a type approved by the Commandant. Excluding the emergency boats, not more than one type of releasing gear shall be fitted in the lifeboats of a particular vessel.

PART 60—BOATS, RAFTS, BULKHEADS, AND LIFESAVING APPLIANCES (COASTWISE)

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60 12	Construction of metallic lifeboats of class 1A	60 47a	Buoyant apparatus
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60 14	Construction of wooden lifeboats	60 48	Life preservers
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60 22	Lifeboats and life rafts kept clear for launching	60 58	Means of escape from steamers
		60 60	Vessel's name on equipment
		60 61	Disengaging apparatus

Section 60 1 Coastwise steamers Under this designation shall be included all steam vessels navigating the waters of any ocean or the Gulf of Mexico 20 nautical miles or less offshore

For the purpose of apportioning lifeboat and life-raft equipment upon coastwise steam vessels subject to the jurisdiction of the Coast Guard, they shall be divided into the following classes

- (a) Passenger steam vessels
- (b) Passenger steam vessels the keels of which are laid after July 1, 1915
- (c) Cargo steam vessels and all other steam vessels unless hereinafter provided for.

60 2 Lifeboats and life rafts required on vessels of class (a). Vessels of class (a) shall be required to have lifeboat and life raft capacity to accommodate all persons on board. Not less than 75 percent of the total capacity shall be in lifeboats and 25 percent may be in collapsible lifeboats or life rafts of an approved type

Vessels of class (a) during the interval between May 15th and September 15th in any one year, both dates inclusive, shall be required to be equipped with lifeboats, life rafts, and buoyant apparatus to accommodate all persons on board, not less than 35 percent of which shall be in lifeboats, 35 percent in collapsible lifeboats or life rafts, and 30 percent may be in buoyant apparatus

60 3 Lifeboats and life rafts required on vessels of class (b) Vessels of class (b) shall be required to have lifeboat and life raft capacity to accommodate all persons on board throughout the year, not less than 75 percent of which shall be in approved lifeboats and 25 percent may be in collapsible lifeboats or rafts of an approved type

60 4 Lifeboats required on vessels of class (c) (See § 59 6 of this chapter, which is identical with this section)

60 5 Carrying of lifeboats on vessels of classes (a) and (b). (See § 59 7 of this chapter, which is identical with this section)

60 6 Lifeboats required on inspected motor vessels. (a) All vessels propelled by machinery other than steam, subject to the inspection laws of the United States, shall have the same lifeboat and life raft equipment as steamers of the same class, and the Officer in Charge, Marine Inspection, shall so indicate in the certificate of inspection.

(b) Coastwise motor passenger vessels subject to inspection, except such as are engaged on an international voyage and carry more than 12 passengers or are above 300 gross tons and seagoing shall be equipped with lifeboatage and other lifesaving equipment as follows

(1) One lifeboat of a type and size which it would be practicable to place on board and be adequately manned by the crew, together with life rafts, life floats, or buoyant apparatus, capable of immediate use. This lifesaving equipment shall provide sufficient accommodations for all persons on board including passengers and crew

(2) On vessels where it is impracticable to provide a lifeboat, sufficient life rafts, life floats or buoyant apparatus shall be provided to accommodate all persons on board including passengers and crew

60 7 Lifeboat and other equipment required on sail vessels Coastwise sail vessels carrying passengers under the provisions of section 4417, Revised Statutes, as amended by the Act of Congress approved March 3, 1905 (Sec 1, 33 Stat 1023, 46 U S C 391), shall be subject to the same requirements for lifeboat capacity as coastwise steamers of the same class, and in addition thereto they shall be equipped with a life preserver for each and every person on board

60 8 Lifeboats and their equipment required on inspected seagoing barges of 100 gross tons or over (See § 59 10 of this chapter, which is identical with this section)

60 8a General requirements as to equipment for lifeboats, life rafts, and buoyant apparatus Vessels subject to this part shall comply with the requirements in § 59 10a of this chapter in effect on August 19, 1944

60 9 Lifeboat equipment See § 59 11 of this chapter, which is identical with this section except for par (f), which reads as follows

(f) **Parachute flare distress signals.** (1) Twelve approved parachute red flare distress signals and an approved means of projecting them, all contained in a portable watertight case Service use of the signals shall be limited to a period of 3 years from date of manufacture (For specifications for the above equipment, see subparts 160 024 and 160 036 in Subchapter Q of this chapter)

(2) On passenger vessels certificated for the Coastwise Service, parachute red flare distress signal outfits shall be provided in the ratio of one outfit for each five boats or fraction thereof

(3) The stowage of this equipment, except in the emergency and motor lifeboats, is discretionary with the master

(4) On cargo vessels, parachute red flare distress signal equipment need not be provided for more than two lifeboats

NOTE—The specifications for distress signals are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein As these specifications cover the manufacture of equipment, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows

160 021 Signals, Distress, Flare, Red, Hand (46 CFR subpart 160 021)

160 022 Signals, Distress, Smoke, Orange, Floating (46 CFR subpart 160 022)

160 023 Signals, Distress, Combination Flare and Smoke, Hand (46 CFR subpart 160 023)

160 024 Signals, Distress, Pistol-Projected Parachute, Red Flare (and Signal Pistol) (46 CFR subpart 160 024)

160 036 Signals, Distress, Hand-Held Rocket-Propelled Parachute, Red Flare (46 CFR subpart 160 036)

60 10 Drawings, specifications, name plate (See § 59 13 of this chapter, which is identical with this section)

60 11 Inspection of lifeboats when built (See § 59 14 of this chapter, which is identical with this section)

60 12 Construction of metallic lifeboats of class 1A (See § 59 15 of this chapter, which is identical with this section)

60 13 Air tanks of lifeboats. (See § 59 30 of this chapter, which is identical with this section)

60.14 Construction of wooden lifeboats. (See § 59 16 of this chapter, which is identical with this section)

60 15 Carrying capacity of lifeboats The capacity of all lifeboats not otherwise provided for shall be determined by the following rule Measure the length and breadth outside of the planking or plating and the depth inside at the place of minimum depth The depth used in calculating shall not in any case exceed 45 percent of the breadth The product of these dimensions multiplied by 0.6 resulting in the nearest whole number shall be deemed the capacity in cubic feet

To determine the number of persons a boat is to carry, divide the result by 10 for coastwise steamers

Example The carrying capacity of a boat 22 feet in length, 6 feet in breadth, and 2½ feet in depth shall be determined as follows

For ocean steamers,

$$\frac{22 \times 6 \times 2\frac{1}{2} \times 0.6}{10} = \frac{198}{10} = 19 \text{ persons}$$

Every lifeboat shall have sufficient room, freeboard, and stability to safely carry the number of persons allowed to be carried by the above rule, which fact shall be determined by actual test in the water at the time of the first inspection of the lifeboat, except that where a vessel is carrying lifeboats of different types or capacities, at least one lifeboat of each type or capacity shall be so tested

60 16 Size of boats No lifeboat for use on coastwise steam vessels shall be of less than 180 cubic feet capacity, except that all pleasure steamers, and other steamers not exceeding 1,000 gross tons limited by their certificate of inspection to routes not exceeding 15 miles from any harbor shall only be required to carry one lifeboat of 180 cubic feet capacity. Nothing, however, shall exempt such steamers from carrying the aggregate cubic capacity required by the rules. The minimum capacity of lifeboats for this class of vessels shall be 125 cubic feet

The Coast Guard District Commander may, in exceptional cases, permit lifeboats of less than 180 cubic feet as a substitute for said boat on steamers where the crew is insufficient to properly handle a boat of that size, or where there is lack of space to properly carry so large a lifeboat, but in every such case the steamer shall be provided with one or more lifeboats efficient in character and large enough to carry every person on board, and in no case shall the lifeboat be of less capacity than 125 cubic feet

Provided, further, That on steamers of 100 gross tons and under, operating within 5 miles of land, where there is a lack of space to properly carry a boat of 125 cubic feet, the Coast Guard District Commander may permit lifeboats of less than 125 cubic feet, provided they are large enough and of suitable character to carry every person on board

60 17 Tests of lifeboats at annual inspection. (See § 59 39 of this chapter, which is identical with this section)

60 18 Care of lifeboats (See § 59 38 of this chapter, which is identical with this section)

60 19 Blocks and falls (See § 59 37 of this chapter, which is identical with this section)

60 20 Numbering and marking of lifeboats (See § 59 35 of this chapter, which is identical with this section)

60 21 How lifeboats shall be carried, davits and cranes required. All lifeboats on vessels carrying passengers shall, if practicable, be carried under substantial davits or cranes, but if it is not practicable so to carry all the lifeboats required, the remainder shall be stowed near at hand, so as to be easily and readily launched. Such davits, cranes, and necessary gear shall be such as will enable the lifeboats to be lowered to the water in less than 2 minutes from the time the clearing away of the boats is begun

Each lifeboat carried under davits shall be provided with two separate davits. When a single crane is properly adapted to lower a lifeboat, it may be allowed to take the place of the two davits. Such davits or cranes, and the blocks and falls thereof, on all passenger vessels, shall be of sufficient strength to carry the boat with its full load

Vessels of class (c) shall be equipped with davits or other practicable means for properly launching the lifeboats. Mechanical davits, when installed on vessels of class (c), shall be subject to all the tests required by this section

No type or make of mechanical or gravity davit shall be used unless it has first been approved by the Commandant

No mechanical davits of a character which require manual or other power to turn the boats out to the position for lowering into the water shall be fitted on any vessel the keel of which is laid after September 1, 1941, if such davits are to handle a lifeboat which, without its complement of persons on board, but having on board all air tanks and other lifeboat equipment, exceeds 5,000 pounds total weight, i e , 2,500 pounds for a single davit arm. An exemption to this requirement may be granted during the period of the national emergency proclaimed by the President on May 27, 1941, if evidence is presented to the Commandant to substantiate a claim that compliance with this requirement would materially delay the completion and delivery of the vessel

Davits of an approved type, which are capable of swinging the boats into the lowering position without the application of any effort or external force other than that necessary to operate the releasing mechanism, allowing the boat to move from the stowed position to the lowering position by the force of gravity, shall be provided to handle all lifeboats the total weight of which, including air tanks and lifeboat equipment, but without the complement of persons on board, exceeds 5,000 pounds

Where steel castings are used for davit frames or davit arms this material shall be fully annealed and comply with the following requirements

(In substantial agreement with A S T M Spec A 27-42 and A 215-41)

Tensile strength, minimum psi.....	66,000
Yield point, minimum psi.....	33,000
Elongation in 2 inches, minimum percent.....	22
Reduction of area, minimum percent.....	33

Chemical composition for castings not intended to be fusion welded

(In substantial agreement with A S T M Spec A-27-42)

Manganese, maximum percent.....	1 00
Phosphorus, maximum percent.....	05
Sulphur, maximum percent.....	06

Chemical composition of castings intended to be fabricated by fusion welding

(In substantial agreement with A S T M Spec A-215-41)

Carbon, maximum percent.....	0 30
Manganese, maximum percent.....	70
Phosphorus, maximum percent.....	05
Sulphur, maximum percent.....	06
Silicon, maximum percent.....	50

For each reduction of 0 01 percent below the maximum specified carbon content, an increase of 0 04 percent manganese above the specified maximum will be permitted up to a maximum 1 00 percent

Where structural steel is used for the fabrication of davit frames or davit arms the material shall conform to the following requirements

(In substantial agreement with A S T M Spec A-131-39 and A-7-42)

Tensile strength, psi.....	60,000 to 72,000
Yield point, minimum psi.....	0 5 T S
Elongation in 8 inches, minimum percent.....	1,500,000
	Ten Str
Elongation in 2 inches, minimum percent.....	22

Where welding is employed in the construction of davits, the welder shall be qualified by the Coast Guard

All moving parts of davits shall be provided with bushings of nonferrous metal, roller or ball bearings properly lubricated

An inspector shall be present at the foundry where castings are made to witness the tensile and bend tests prescribed. The manufacturer shall furnish an affidavit stating that the required tests for annealing have been made. When the inspector has satisfied himself that such castings comply with the requirements, he shall stamp the davit arm and frame with the letters U S C G, the initials of his name and the letters F T, and date of inspection

Each davit and frame shall be tested for strength and operation at the place of manufacture in the presence of an inspector

All mechanical and gravity davit arms or frames shall be tested at the extreme outboard position by suspending from the eye or end of each davit arm a weight equal to the weight of the fully loaded and equipped boat (including full complement of persons at 165 pounds each) for which the davit is to be approved, plus 10 percent. Under this test, a davit arm or frame shall show no permanent set or undue deflection. While this test is being conducted, the frame and arms, if of cast material, shall be subjected to a test by being hammered to satisfy the inspector that the castings are sound and without flaw

While this test load is suspended, the operating gear of mechanical davits shall be tested by being operated from inboard to the extreme outboard position with the same operating crank or device used in actual practice aboard ship

The manufacturer shall affix to the davit arm and frame a heavy plate giving the name of manufacturer, date of inspection, serial number, capacity load, space for the inspector's initials, and the letters U S C G. After the inspector has satisfied himself that the assembled installation meets the requirements, he shall stamp the manufacturer's plates with his initials. Each set of davits shall be marked with identical serial numbers by the manufacturer

No davit arm or frame comprising mechanical or gravity davits shall be placed on board any vessel until all of the requirements of the rules of this section have been fully complied with. Whenever mechanical or gravity davits or parts of davits, such as davit arms, or frames, are installed on vessels to take the place of davits, davit arms, or frames which have become damaged or broken, such davits or frames shall have the manufacturer's name plate affixed thereto

60 21a Mechanical means for lowering (See § 59 3a of this chapter, which is identical with this section)

60 22 Lifeboats and life rafts kept clear for launching (See § 59 36 of this chapter, which is identical with this section)

60 23 Handling of boats and rafts (See § 59 41 of this chapter, which is identical with this section)

60 26 Inclosed lifeboats All steamers carrying passengers shall be equipped with at least one lifeboat of approved open standard type. Where two lifeboats are required, one of the same may be of an approved inclosed type. Where three or more lifeboats are required, two of such lifeboats shall be of approved open standard type, one to be carried on each side under davits. In no case shall the lifeboat equipment of any steamer consist of more than 50 percent of approved lifeboats of inclosed type

When the approved inclosed type of lifeboats is carried on steamers other than those carrying passengers, such steamers shall also be equipped with one lifeboat of approved open standard type of not less than 180 cubic feet capacity

60 29 Life rafts Drawings, specifications, name plate, and how marked (See § 59 42 of this chapter, which is identical with this section)

60 30 Inspection of life rafts when built (See § 59 43 of this chapter, which is identical with this section)

60 31 Construction of rafts of the catamaran type (See § 59 44 of this chapter, which is identical with this section)

60 32 Tests of air tanks of life rafts (See § 59 45 of this chapter, which is identical with this section)

60 33 Care of life rafts (See § 59 46 of this chapter, which is identical with this section)

60 34 Approved life rafts (See § 59 47 of this chapter, which is identical with this section)

60 35 Carrying capacity of life rafts No type of raft may be approved for coastwise steam vessels unless it satisfies the following conditions

(a) It should be reversible

(b) It should be of such size, strength, and weight that it can be handled without mechanical appliances, and, if necessary, be thrown from the vessel's deck

(c) It must have not less than 3 cubic feet of air cases or equivalent buoyancy and not less than 3 square feet of deck surface for each person allowed Rafts already in use may have the rating changed by the Coast Guard District Commander of the district where the same are being used to meet these requirements and allowances

(d) The air tanks or equivalent buoyancy should be placed as near as possible to the sides of the raft

At least one-half of the number of life rafts on all steam vessels shall have a capacity exceeding 15 persons

Tule and all other types of catamaran life rafts shall meet the requirements herein specified

60 45 Equipment for life rafts (See § 59 52 of this chapter, which is identical with this section)

60 46 Certificated lifeboatmen; manning of the boats There shall be for each boat or life raft a number of lifeboatmen at least equal to that specified in the following table

If the prescribed complement is—	The minimum number of certificated lifeboatmen shall be—
Less than 26 persons.....	1
From 26 to 40 persons.....	2
From 41 to 61 persons.....	3
From 62 to 85 persons.....	4
Above 85 persons.....	5

The allocation of the certificated lifeboatmen to each boat and raft remains within the discretion of the master, according to the circumstances

60 47 Manning of the boats. A licensed officer or able seaman shall be placed in charge of each boat or pontoon raft, he shall have a list of its lifeboatmen, and other members of its crew which shall be sufficient for her safe management, and shall see that the men placed under his orders are acquainted with their several duties and stations

A man capable of working the motor shall be assigned to each motorboat

The duty of seeing that the boats, pontoon rafts, and other lifesaving appliances are at all times ready for use shall be assigned to one or more officers

60 47a Buoyant apparatus—(a) Definition. Buoyant apparatus is defined as buoyant deck seats, buoyant deck chairs, and life floats or other apparatus, having buoyancy, except lifeboats, life buoys, and life preservers, and no buoyant apparatus shall be approved which requires any adjustment or preparation

(b) General requirements Buoyant apparatus shall conform to the following general requirements

(1) Its construction shall be of material and workmanship adequate for the purpose intended

(2) It shall be effective and stable floating either side up

(3) It shall have a line securely becketed around the outside and/or pendants to accommodate the number of persons allowed

(4) It shall be of such size, strength, and weight as to be handled without mechanical appliances and thrown without damage from the deck where stowed

(5) Its weight shall in no case exceed 200 pounds

(6) It shall have air cases or equivalent buoyancy placed as near as possible to its sides

(c) Capacity (1) The number of persons for which any type of buoyant apparatus may be deemed suitable shall be determined, subject to the result of the stability test by the least of the numbers ascertained, as follows (1) Number of pounds of iron the apparatus is capable of supporting in fresh water, divided by 32, (2) the number of feet in the perimeter

(2) The divisor given in paragraph (1) shall be required to be increased where the apparatus is designed so that persons supported are only partially immersed in the water, or where facilities are provided for climbing onto the top of it

(d) Stability Every type of buoyant apparatus shall be capable of supporting along any edge, without capsizing, a weight of iron 15 pounds per foot length suspended in the water from the life lines. Where the length of the edge is 4 feet or less the minimum weight of iron suspended from any edge shall be 60 pounds

(e) Test for strength Every new type of buoyant apparatus shall be tested for strength by dropping a sample into the water from a height of 60 feet

(f) Air tanks—(1) Material Where metal air tanks furnish the buoyancy of the apparatus, they shall be constructed of best-quality copper or yellow metal of not less than 18 ounces to the superficial foot. All joints shall be securely hook-jointed and efficiently soldered, or properly and securely welded. Air tanks shall be fitted with suitable testing nipples, and when testing same an air pressure of not more than 1 pound to the square inch shall be used

(2) Size Air tanks shall be not more than 4 feet in length, but where more than 2 feet 6 inches in length or breadth they shall be efficiently stiffened by divisions or stays. At no time shall the cases be pierced for the attachment of wood divisions or stays, nor for any other purpose

(3) Protection Air tanks shall not be placed in contact with metal iron-work, and they shall be protected from injury by properly fitted solid wood casing and secured against movement therein

(g) Name plate Each piece of buoyant apparatus shall have a brass plate or its equivalent fixed thereon by the builder, and bearing his name and address, the words "Buoyant apparatus," the number of the apparatus, date of construction, dimensions, and number of persons allowed

(h) Factory inspection Buoyant apparatus shall be examined at the factory by an inspector, who shall satisfy himself that it has been constructed in accordance with plans and specifications on file in the office of the Coast Guard District Commander, after which he shall stamp the initials of his name, the letters U S C G, and the date on the name plate

(i) Stowage Buoyant apparatus shall be stowed as follows

(a) They shall not impede in any way prompt handling of lifeboats, or the marshaling of persons on board at launching stations

(b) They shall be stowed in such manner as to be readily launched

(c) They shall not be secured to the deck except by lashings which can be easily slipped, but may be stowed in tiers one above the other, in which case the separate units shall be kept apart sufficiently to prevent sticking together, and supported on suitable distance pieces

(d) Means shall be provided to prevent shifting

60 47b Equipment for buoyant apparatus (See § 59 54b of this chapter, which is identical with this section)

60 48 Life preservers. (See § 59 55 of this chapter, which is identical with this section)

60 49 Life buoys—(a) Number required (1) The minimum number of approved 30-inch life buoys and the minimum number to which approved water lights shall be attached shall be in accordance with the following table

Length of vessel	Minimum number of approved 30 inch life buoys	Minimum number of approved 30 inch life buoys with approved water lights attached
Under 100 feet	2	0
100 feet and under 200 feet	4	2
200 feet and under 300 feet	6	2
300 feet and under 400 feet	12	4
400 feet and under 600 feet	18	6
600 feet and under 800 feet	24	12
800 feet and over	30	18

(2) One life buoy on each side of a vessel shall have an attached line at least 15 fathoms in length

(b) **Distribution and securing of life buoys and water lights.** All life buoys and water lights shall be distributed and secured as follows

(1) All life buoys shall be so placed as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to the persons concerned

(2) The life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way

Note—The specifications for life buoys are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the manufacture of ring buoys, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows

160 009 Buoys, Life, Ring, Cork and Balsa Wood (46 CFR subpart 160 009)

164 001 Cork, Sheet (46 CFR subpart 164 001)

164 002 Balsa Wood (46 CFR subpart 164 002)

60 50 Self-igniting water lights (See § 59 57 of this chapter, which is identical with this section.)

60.53 Line-carrying guns and equipment All coastwise vessels of 150 gross tons and over shall be equipped with a line-carrying gun and equipment auxiliary thereto, as specified in this part

60.54 Line-throwing appliances. (See § 59 61 of this chapter, which is identical with this section)

60 55 Steering apparatus. (See § 59 62 of this chapter, which is identical with this section)

60 56 Embarkation aids (See § 59 63 of this chapter, which is identical with this section)

60 57 Bulkheads on passenger vessels less than 100 gross tons (a) Every mechanically propelled vessel carrying passengers for hire shall have not less than three watertight transverse bulkheads properly secured to the hull of the vessel. The arrangement of the

bulkheads shall be such that the vessel will remain afloat in the event any one main compartment is flooded (Effective on and after January 1, 1943)

(b) A forepeak or collision bulkhead shall be fitted and located not less than 5 percent of the length of the vessel, and not more than 10 feet plus 5 percent of the length of the vessel from the bow, at load water line

(c) One bulkhead shall be fitted at the forward end of the machinery space (which includes boiler space) and one bulkhead shall be fitted at the aft end of the machinery space. Other transverse bulkheads shall be so located as to meet the above requirements of subdivision and stability

(d) Main transverse bulkheads may be stepped or recessed. Where a main transverse bulkhead is stepped, subdivision and strength are to be provided in way of the step to maintain the same measure of safety as that secured by the vertical bulkhead. No recess shall be fitted nearer the vessel's side than one-fifth of the vessel's beam amidships measured at right angles to the center line at the level of the load water line on which the subdivision is based. Bulkheads shall extend to a deck whose distance above the load water line is sufficient to enable the subdivision and stability requirements to be met with a fair margin of safety

(e) If the distance between two adjacent main transverse watertight bulkheads is less than 10 feet plus 2 percent of the vessel's length measured between perpendiculars at the extremities of the vessel's load water line, only one of these bulkheads shall be regarded as forming a boundary of a main compartment

(f) Existing vessels shall comply with the above rules unless it can be shown by the owners that their application is impracticable and unreasonable

(g) Mechanically propelled vessels of 100 tons burden or under, engaged in the coastwise bays and harbors of the United States, may be licensed by the Officer in Charge, Marine Inspection, to carry passengers or excursions on the ocean, not exceeding 15 miles from the mouth of such bays or harbors, without being required to have the three watertight transverse bulkheads provided by section 4490 (46 U S C 482) of the Revised Statutes for other passenger vessels. *Provided*, That in the judgment of the Officer in Charge, Marine Inspection, such vessels shall be safe and suitable for such navigation without danger to human life, and that they shall have one watertight collision bulkhead not less than five feet abaft the stem of said vessels

60 57a Bulkheads on passenger vessels 100 gross tons and over. See part 144, subchapter M (Construction or Material Alteration of Passenger Vessels of the United States of 100 Gross Tons and Over Propelled by Machinery), of this chapter

60 58 Means of escape from steamers. (See § 59 65 of this chapter, which is identical with this section)

60 60 Vessel's name on equipment (See § 59 67 of this chapter, which is identical with this section)

60 61 Disengaging apparatus (See § 59 68 of this chapter, which is identical with this section)

PART 61—FIRE APPARATUS, FIRE PREVENTION

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Section 61 01 Basis and purpose of regulations By virtue of the authority vested in the Commandant of the Coast Guard under section 101 of the Reorganization Plan No 3 of 1946 (11 F R 7875), R S 4405, 4426, 4470, 4471, 4477, and 4479, as amended, Act of June 20, 1936, section 2 of Act of October 9, 1940, and section 5 (e) of Act of June 6, 1941 (46 U S C 367, 375, 404, 463, 463a, 464, 471, 472, 50 U S C 1275), the regulations in this part are prescribed to provide adequate means for detecting, preventing, or fighting of fires on board vessels subject to these regulations in accordance with the intent of the various statutes on fire apparatus or fire prevention and to obtain their correct and uniform administration

61 1 Fire axes. All steamers navigating oceans are required to be provided with axes, as follows

Gross tons	Axes
All steamers not over 10 tons.....	1
All steamers over 10 tons and not over 50 tons.....	1
All steamers over 50 tons and not over 200 tons.....	2
All steamers over 200 tons and not over 500 tons.....	4
All steamers over 500 tons and not over 1,000 tons.....	6
All steamers over 1,000 tons.....	8

61 2 Location of axes. All axes shall be located so as to be readily found in time of need, shall not be used for general purposes, and shall be kept in good condition

61 3 Glass lamps The use of glass lamps shall be prohibited on any vessel under the jurisdiction of the Coast Guard unless the same are securely fitted into suitable metal brackets

61 4 Steam and inert-gas fire-extinguishing systems—(a) General requirements
(1) All mechanically propelled vessels carrying combustible cargo in the holds, 'tween-decks, or other closed cargo compartments, except those engaged exclusively in the carriage of coal in bulk, shall be equipped with means for extinguishing fire in such compartments by the use of a steam fire-extinguishing system or by the use of any inert-gas fire-extinguishing system approved by the Commandant

(2) Cabinets, boxes, or casings inclosing manifolds or valves shall be distinctly marked in painted letters about 3 inches in height, "Steam Fire Apparatus" or "CO₂ Fire Apparatus," as the case may be

(3) Steam or gas piping fitted for extinguishing fire shall not be used for any other purpose except that it may be used for fire-detecting purposes

(4) Pipes for conveying steam from the boilers for the purpose of extinguishing fire shall not be led into the cabins, other passengers' or crew's quarters, or working spaces Pipes for conveying carbon dioxide or other extinguishing vapors for the purpose of extinguishing fire shall not be led into the cabins or other passengers' or crew's quarters

(5) Steam smothering lines shall be tested with at least 50 pounds air pressure with ends of the smothering lines capped, or by blowing steam through the lines, and a survey made for detecting corrosion and defects, using the hammer test or such other means as may be necessary

(6) At annual inspections, all carbon dioxide (CO₂) cylinders, whether fixed or portable, shall be examined externally and replaced if excessive corrosion is found, and all cylinders

shall also be checked by weighing to determine contents and if found to be more than 10 per cent under required contents of carbon dioxide, the same shall be recharged

(b) Steam systems on mechanically propelled vessels contracted for prior to July 1, 1935.

(1) The main pipes and their branches, on mechanically propelled vessels carrying passengers or freight, to convey steam from the boilers to the hold and separate compartments of the same shall be not less than 1½ inches in diameter. Steam pipes of not less than three-fourths of an inch in diameter shall be led into all lamp lockers, oil rooms, and like compartments, which lamp lockers, oil rooms, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal.

(2) All branch pipes leading into the several compartments of the hold of the vessel shall be supplied with valves, the handles distinctly marked to indicate the compartment or parts of the vessel to which they lead. These valves or their handles shall be placed in not more than two places on the most suitable and accessible deck of the vessel and so arranged that all can be inclosed in cabinets, boxes, or casings.

(c) Steam systems on mechanically propelled vessels contracted for on or after July 1, 1935. (1) Steam for fire-extinguishing systems shall be available from the main boilers or from a donkey or auxiliary boiler having a minimum capacity equivalent to one square foot of heating surface for each 300 cubic feet of the largest compartment in which cargo is carried. This requirement shall be based upon a rate of evaporation of six pounds of steam per hour per square foot of heating surface from and at 212° F medium steaming. Equivalent values of heating surface will be permitted for boilers having rates of evaporation differing from that herein specified.

(2) The minimum boiler capacity shall be based upon the volume of the largest compartment in cubic feet, which shall be determined by measurements taken between fire-retarding boundaries such as decks having hatch covers with proper battening down arrangements, shells, tank tops, watertight and fire-retarding bulkheads.

(3) A steam pressure of at least 100 pounds per square inch shall be maintained for fire-extinguishing purposes. Where the maximum allowable boiler working pressure will not permit of this, the maximum steam pressure permitted by the operating boiler pressure limitations shall be provided for this purpose.

(4) The pipe lines shall be led from not more than three stations in easily accessible locations on the weather deck to each cargo hold, cargo 'tween-decks, or other closed cargo compartments, and to each cargo-oil deep tank, lamp locker, oil room, and like compartments, which lamp locker, oil room, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal. The steam connections to the lamp lockers, oil rooms, and like compartments may be taken from the nearest steam supply line, independent of the extinguishing manifolds. In lamp lockers, oil rooms, and like compartments, adequate means may be provided for ventilation if suitable dampers capable of being operated from outside the spaces are fitted in each vent duct.

(5) Each pipe in the extinguishing manifolds shall be fitted with a shut-off valve plainly and permanently marked to indicate into which compartment it discharges. This requirement also applies to independent extinguishing lines.

(6) Manifold steam supply pipes shall be fitted with master valves at the manifolds, and provision shall be made for draining the manifold and individual lines to protect them against freezing. If the manifolds are located on an open deck, they shall be inclosed in a metal box.

(7) The minimum diameter of any steam fire-extinguishing pipe to a cargo hold, cargo 'tween-decks, other closed cargo compartments, or cargo-oil deep tank shall be one inch, the size and number of pipes to be governed by the size of the compartment. The minimum diameter of any steam fire-extinguishing pipe to a lamp locker, oil room, or like compartments, shall be three-fourths of an inch.

(8) The required diameter of pipe to cargo compartments may be determined by the formula

$$D = \sqrt{\frac{C}{30,000}}$$

where

D = required diameter of pipe, in inches

C = volume of compartment, in cubic feet

or by the following table

Volume of compartment	Number of branches to compartment	Size of branches
		<i>Inches</i>
30,000	1	1
48,000	1	1 1/4
67,000	1	1 1/2
94,000	2	1 1/2
136,000	2	1 3/4
208,000	3	1 3/4

(9) The diameter of the main supply line to the manifolds shall be computed by the following formula

$$D = \sqrt{\frac{C}{60,000}}$$

where

D = diameter of pipe required, in inches

C = volume of all compartments, in cubic feet

(d) **Inert-gas systems on mechanically propelled vessels.** (1) When a carbon dioxide (CO_2) smothering system is fitted in the cargo hold, cargo 'tween-decks, or other closed cargo compartments, or cargo-oil deep tanks, the quantity of carbon dioxide shall be sufficient to give a gas saturation of 30 percent of the gross volume of the largest cargo hold. The quantity in pounds of carbon dioxide required may be determined approximately by the following formula

$$W = \frac{L \times B \times D}{30}$$

where

W = the weight of CO_2 required, in pounds

L = the length of the hold, in feet

B = the mean breadth of the hold, in feet

D = the depth from tank top or flat forming lower boundary to top of uppermost space in which freight may be carried, in feet

(2) When a carbon dioxide (CO_2) smothering system is fitted in the lamp locker, oil room, or like compartments, the quantity in pounds of carbon dioxide required may be determined by dividing the gross volume of the space by a factor of 22. Lamp lockers, oil rooms, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal. The whole charge of gas shall be capable of being released simultaneously by operating one valve and control, and all cylinders shall be completely discharged in not more than two minutes.

(3) Pipes used for supplying carbon dioxide to the cargo holds, cargo 'tween-decks, other closed cargo compartments, and cargo-oil deep tanks shall be not less than three-fourths inch inside diameter. Pipes used for supplying carbon dioxide to lamp lockers, oil rooms, and like compartments shall not be less than one-half inch inside diameter.

(4) The control(s) releasing the inert gas shall be located in a position(s) outside the space(s) protected and shall be readily accessible when the vessel is being navigated. All valves shall be permanently marked to indicate into which compartment they discharge.

(5) Provisions shall be made to prevent the admission of air into the lower parts of cargo holds, cargo 'tween-decks, and other closed cargo compartments while the inert-gas system is in operation

(6) Cylinders, piping, and controls for the inert-gas system shall be protected from damage and shall be securely fastened and supported

615 Steam fire pumps or their equivalent—(a) Fire pumps on steam vessels contracted for prior to July 1, 1935 (1) Steam vessels required to be provided with double-acting steam fire pumps or other equivalents for throwing water shall be equipped with such pumps according to their tonnage, as follows Steam vessels over 20 gross tons and not exceeding 150 gross tons shall have not less than 50 cubic inches pump-cylinder capacity Steam vessels of over 150 gross tons and under 3,000 gross tons shall have not less than one-third of 1 cubic inch pump-cylinder capacity for every gross ton Steam vessels of 3,000 gross tons and over shall have pump-cylinder capacity of not less than 1,000 cubic inches This rule shall apply only to pumps installed after June 30, 1907, and all pumps now approved and in use or installed before said date shall be accepted if complying with requirements of law and regulations in force at the time of their installation

(2) On steam vessels required by paragraph (a) (1) above to have steam fire pumps or their equivalents, the fire mains shall be led from the pumps to all decks, with sufficient number of outlets arranged so that any part of the steam vessel can be reached with water with the full capacity of the pumps and by means of a single 50-foot length of hose from at least one of said outlets On all classes of steam vessels every such pump shall be fitted with a gage and a relief valve of such size as to restrict the pressure of water to 100 pounds per square inch

(b) Fire pumps on steam vessels contracted for on or after July 1, 1935 (1) Passenger vessels of 100 gross tons and under shall be equipped with one hand fire pump with a pump-cylinder capacity not less than 100 cubic inches, or a power-driven pump of equivalent discharge capacity

(2) Vessels exceeding 100 gross tons shall be equipped with fire pumps and fire piping as follows

(i) All vessels shall be provided with powerful pumps available for use as fire pumps Passenger vessels of less than 4,000 gross tons shall have 2, and larger passenger vessels at least 3 independently driven pumps connected to the fire main Cargo vessels and towing vessels of less than 1,000 gross tons shall have 1, and larger cargo or towing vessels at least 2 such pumps so arranged Each pump shall be capable of delivering two powerful jets of water simultaneously from the highest outlets on the fire main at a Pitot tube pressure of approximately 50 pounds per square inch through nozzles, each having an orifice of not less than $\frac{1}{4}$ inch diameter where the internal diameter of the hose exceeds $1\frac{1}{2}$ inches and not less than $\frac{3}{8}$ inch in diameter where the internal diameter of the hose does not exceed $1\frac{1}{2}$ inches

(ii) On oil-burning passenger vessels, where two or more pumps are required, they shall not all be located in the same compartment Where the engine and firerooms are not entirely separated by steel bulkheads, or if fuel oil can drain from the fireroom bilges into the engine room, one of the fire pumps shall be located in an accessible space in a separate compartment.

(iii) On oil-burning cargo vessels, where two pumps are required, they may be located in the same compartment, provided the compartment is equipped with an approved fixed carbon dioxide extinguishing system

(3) Outlets from the fire mains shall be of a sufficient number and so arranged that any part of the living quarters, weather decks and any part of cargo decks, accessible to crew or passengers, while the vessel is being navigated, may be reached with a single 50-foot length of hose Outlets within accommodations and service spaces adjacent thereto

shall comply with the above or they may be so arranged that any part may be reached with a single 75-foot length of hose provided a siamese connection is fitted at each outlet. Where the fire main is located on an exposed deck, branches shall be provided so that the hose connections necessary to comply with the foregoing be distributed on both sides of the vessel. The fire hose shall be connected to the outlet at all times, except on open decks where the location of the fire hydrants is such that no protection is afforded for the hose in heavy weather. The fire hose may be temporarily removed from the hydrant when it will interfere with the handling of cargo.

(4) Outlet openings shall have a diameter of not less than $1\frac{1}{2}$ " and shall be fitted with suitable hose connections and spanners. The arrangement of the fire hydrant shall be limited to any position from the horizontal to the vertical pointing downward, so that the hose will lead downward or horizontally, in order to minimize the possibility of kinking. In no case will a hydrant arranged in a vertical position with the outlet pointing upward be accepted.

(5) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 pounds higher than the pressure necessary to maintain the requirements of paragraph (b) (2) (1), above, and a pressure gage to indicate the pressure on the fire main. If the fire pumps operating under shut-off conditions are not capable of producing a pressure exceeding 125 pounds per square inch, the relief valve may be omitted.

(6) Fire hose shall not be used for any other purpose than fire extinguishing.

61.5a Couplings on fire hose The couplings on fire hose shall be of brass, copper, or composition material.

61.6 Dimensions of fire pump, spanners Steamers are not restricted to any particular proportions for fire pumps. Any dimensions that will attain the requirements specified in § 61.5, or greater in capacity, may be allowed. *Provided, however,* That all hydrant connections be supplied with suitable spanners.

61.7 Capacity of pipes and hose The capacity of the pipes and hose leading from the pumps shall in no case be less than that of the discharge opening of the pump. *Provided, however,* That the pipe and hose shall in no instance be less than $1\frac{1}{2}$ inches in internal diameter.

And provided further, That steamers of 15 tons and under may be allowed to use hose of three-fourths of an inch internal diameter, but in no case shall it be less than the discharge opening of the pumps.

61.8 Rotary pumps A rotary pump, when driven by an engine independent of the main engine, may be considered as an equivalent for the double-acting fire pump and used as such when equal to it in efficiency and capacity.

61.9 Boiler-testing pumps Any steamer having on board an independent steam pump and an auxiliary boiler suitably arranged and of sufficient strength and capacity for testing the boilers thereof, or if one of the hand fire pumps be suitably arranged and of sufficient strength and capacity for testing the boilers, or if the "doctor," so called, when arranged permanently for testing the boilers, is, in the judgment of the inspectors, suitable for the purposes intended, may be considered as having complied with the law requiring a pump for testing boilers.

61.10 "Doctor " Any steamer of 50 gross tons or under, required to have a double-acting steam fire pump, and having in use on board a "doctor," so-called, may be considered as having a lawful equivalent for such a pump when such "doctor" has pipes attached to it leading to the upper and between decks, such pipes being provided with hose and valves, according to law, but the pipes and hose shall in no case be less than $1\frac{1}{2}$ inches in internal diameter. The pumps for supplying the boilers shall in no case be considered as an equivalent for the double-acting steam fire pump, on steamers above 50 gross tons.

61.11 Connecting, bilge, and sounding pipes; hose tests. All steam fire pumps required shall be supplied with connecting pipes leading to the hold of the vessel with stop-

cocks or shut-off valves attached and so arranged that such pumps may be used for pumping and discharging water overboard from the hold

Each and every steam vessel shall be fitted with a bilge pipe leading from each compartment of the vessel and connecting with a suitably marked valve to the main bilge pump in the engine room, and each compartment of all steam vessels shall be fitted with suitable sounding pipe, the opening of which shall be accessible at all times, except that in compartments accessible at all times for examination no sounding tubes are necessary

Steam siphons may be substituted in each compartment for the bilge pipes

All hose required on steam vessels for fire purposes shall be tested to a pressure of 100 pounds to the square inch at each inspection, and it shall be the duty of the Officer in Charge, Marine Inspection, at each annual inspection to see that the couplings are securely fastened to the hose by suitable external or internal clamps, and at least one length of such hose shall be kept at all times attached to each outlet of the fire main and provided with a suitable nozzle *Provided*, That on freight steamers where the keeping of such hose coupled on interferes with the loading or unloading of cargo they may be removed during such loading or unloading

61 12 Fire mains and hose connections. All pipes used as mains for conducting water from fire pumps on steam vessels in place of hose shall be of steel, wrought iron, brass, or copper with wrought iron, brass, or composition hose connections

61 12a Pumps on motor vessels Motor vessels of fifty gross tons and over carrying passengers for hire shall be equipped with pumps for throwing water according to the tonnage as described in § 61 5 for steam vessels and equipped as prescribed in §§ 61 5 to 61 7, inclusive, as they now exist or may hereafter be amended

61 13 Portable fire extinguishers All vessels carrying passengers, including pleasure vessels, shall be provided with such number of good and efficient portable fire extinguishers, approved by the Commandant as is hereafter prescribed, viz

Vessels less than 150 feet in length shall have at least two fire extinguishers on each passenger deck, vessels 150 feet and over in length shall be provided with at least one fire extinguisher for every 150 linear feet of corridor length or fraction thereof, in the spaces occupied by passengers and crew In all public spaces extinguishers shall be located not more than 150 feet apart

Freight and towing vessels shall be provided with chemical fire extinguishers as hereafter described, viz

	<i>Minimum number of fire extinguishers</i>
Vessels of over 15 and not over 50 gross tons.....	1
Vessels of over 50 and not over 100 gross tons.....	2
Vessels of over 100 and not over 500 gross tons.....	3
Vessels of over 500 and not over 1,000 gross tons.....	6
Vessels of over 1,000 gross tons.....	8

The above tables of required fire extinguishers are based on the capacity of the ordinary machine, which is about 2½ gallons, and no fire extinguisher of larger capacity shall be allowed a greater rating than that of the ordinary machine Fire extinguishers of approved types of less capacity are allowable under the above tables when their total contents equal the required quantity

All vessels carrying passengers, which transport automobiles or motor vehicles, the motive power of which is generated by any of the products of petroleum or other inflammable liquids shall carry, in addition to the chemical fire extinguishers required by the preceding table for vessels carrying passengers, an approved carbon dioxide, foam type or carbon tetrachloride fire extinguisher which has demonstrated a capacity for extinguishing

burning oils, burning gasoline, and other burning products of petroleum, in accordance with the following table

	Carbon dioxide or foam type fire extinguishers	Carbon tetrachloride fire extinguishers
Automobiles or motor vehicles carried		
1 and not over 5	1	4
6 and not over 10	2	5
11 and not over 20	3	6
21 and not over 30	4	8
31 and not over 40	5	10
41 and not over 50	6	12

For each additional 20 automobiles or motor vehicles, or fraction thereof, add one carbon dioxide or one foam or two carbon tetrachloride fire extinguishers

The requirements may be reduced to 25 percent, but not less than one of either, when an efficient overhead water sprinkling system, a carbon dioxide, or a foam system with sufficient hose to reach all parts of the deck where automobiles or motor vehicles are carried is installed, said systems to be installed in accordance with drawings or blueprints and specifications approved by the Coast Guard District Commander of the district having original jurisdiction

When a vessel is provided with enough fire extinguishers to take care of all the automobiles or motor vehicles that can be carried, no extra fire extinguishers shall be required for any number of motorcycles carried

Extra safety-valve units shall be carried on board for 50 percent of hand fire extinguishers of the foam type, and extra charges shall be carried on board for 50 percent of each class of fire extinguishers provided. If 50 percent of each class of fire extinguishers carried gives a fractional result, extra charges and extra safety-valve units shall be provided for the next largest whole number

Example

Fire extinguishers carried	Extra charges required
1	1
2	1
3	2
4	2
5	3

Provided, however, That when provided with carbon-dioxide type of fire extinguishers, either an additional carbon dioxide extinguisher or a 2½-gallon foam extinguisher may be furnished. For that 2½-gallon foam extinguisher no extra charge will be required

There shall also be carried on board a complete recharge for any fixed or built-in fire-extinguishing system that has been approved by the Commandant, except systems for engine rooms, fire rooms, and cargo holds

Fire extinguishers shall be located in such parts of the vessels as in the judgment of the Officer in Charge, Marine Inspection, will be most convenient and serviceable in case of emergency, and so arranged that they may be easily removed from their fastenings. Every fire extinguisher thus provided for shall be discharged and examined at each annual inspection. *Provided,* That carbon tetrachloride fire extinguishers shall be tested for their pumping efficiency and the liquid discharged with proper care so that it may be replaced in the extinguishers. Carbon dioxide fire extinguishers shall be checked by weighing to determine contents, and, if found to be more than 10 percent under required contents of carbon dioxide, shall be recharged.

Every fire extinguisher provided for and required by this section shall be tested by the Bureau of Standards, Department of Commerce, and a report made by that bureau to the Commandant, which shall then determine whether the said extinguisher shall be approved for use on vessels subject to inspection

Every fire extinguisher approved after September 5, 1933, for use on vessels under the jurisdiction of the Coast Guard, shall have affixed thereto a metallic name plate having plainly stamped thereon the name of the fire extinguisher, the rated capacity in gallons, quarts, or pounds, and the name and address of person or firm for whom approved, and the identifying mark of the actual manufacturer

Recharges, particularly the acid, used in charging soda-and-acid type of fire extinguishers, must be packed in such manner that the filling operation (i. e., in recharging the extinguisher) can be performed without subjecting the person doing the recharging to undue risk of acid burns and shall be contained in Crown stopper type of bottle

61 14 Fire-fighting equipment on vessels using oil as fuel Steam-propelled vessels burning oil for fuel, and seagoing vessels in excess of 300 gross tons propelled by internal-combustion engines, except such seagoing vessels propelled by internal-combustion engines as are engaged in fishing, oystering, clamming, crabbing, or any other branch of the fishery or kelp or sponge industry, shall be fitted with the fire-fighting equipment of the type and character specified below

(a) In each fire room, a metal receptacle containing not less than 10 cubic feet of sand, sawdust impregnated with soda, or other approved dry materials, and scoop or shaker for distributing same *Provided, however,* That vessels of 1,000 gross tons and under using oil as fuel, shall be fitted with a metal receptacle, containing not less than 5 cubic feet of sand, sawdust impregnated with soda, or other approved dry material, and scoop or shaker for distributing same

(b) In each boiler room and in each of the machinery spaces of vessels propelled by steam, in which a part of the fuel-oil installation is situated, two or more approved fire extinguishers of the foam type of not less than 2½ gallons each or two or more approved fire extinguishers of the carbon dioxide (CO₂) type of not less than 15 pounds each shall be placed where accessible and ready for immediate use *Provided,* That on vessels of 1,000 gross tons and under only one of the above-described extinguishers may be required

(c) (1) The fire hose lines in boiler and machinery spaces of existing cargo vessels of 3,000 gross tons and over, and existing passenger vessels exceeding 500 gross tons, shall be equipped with not less than two approved spray nozzles attached to sufficient length of hose so that, in each case, any part of the boiler or engine room space may be reached This equipment shall be kept in efficient condition and ready for immediate use at all times *Provided,* That on existing cargo vessels at least one such spray nozzle hydrant shall be permanently installed in the engine or boiler room space The other spray nozzle and adapter may be used in connection with the regular fire hose and fire line equipment from the deck *Provided,* That sufficient hose is available to reach any part of the boiler or engine room space *Provided, further,* That on cargo and passenger vessels propelled by electric motors, spray nozzles are not required in the main motor room or in the machinery space when the major portion of auxiliaries are electrically driven Spray nozzles are not required in the machinery space on cargo and passenger vessels propelled by internal combustion engines when a major portion of the auxiliaries are electrically driven

(2) In boiler and machinery spaces of new cargo and new passenger vessels of 1,600 gross tons and over, there shall be fitted in each such compartment not less than two spray-nozzle hydrants to which shall be attached sufficient length of hose so that any part of the boiler or machinery space may be reached. An approved spray nozzle shall be attached to each hose line

(d) (1) On all steam propelled vessels having one boiler room there shall be provided one fire extinguisher of the foam type of at least 40 gallons rated capacity or one carbon dioxide (CO₂) extinguisher of at least 100 pounds. If the vessel has more than one boiler room, an extinguisher of the above type shall be provided in each boiler room.

(2) On all steam propelled vessels of 1,000 gross tons and under, foam type fire extinguishers of at least 20 gallons rated capacity or carbon dioxide (CO₂) extinguishers of at least 50 pounds may be used in lieu of the capacities required in (1).

(3) Extinguishers fitted in compliance with (1) and (2) shall be equipped with suitable hose and nozzles on reels or other practicable means easy of access, and of sufficient length to reach any part of the boiler room and spaces containing oil-fuel pumping units.

(e) (1) Steam-propelled passenger vessels burning oil for fuel shall be fitted with an approved fixed carbon dioxide, foam, or water spray system for extinguishing fire in the bilges of each fireroom. If engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room bilge into the engine room, the combined engine and boiler rooms shall be considered one compartment. The system shall be capable of being operated from a convenient and accessible point outside of space protected.

(2) Passenger vessels propelled by internal-combustion engines shall be fitted with an approved fixed carbon dioxide system, for extinguishing fire in the machinery space. The system shall be capable of being operated from a convenient and accessible point outside of space protected.

(f) All vessels propelled by internal-combustion engines shall be equipped with the following foam-type or carbon dioxide fire extinguishers in the machinery spaces:

(1) One approved 12-gallon foam-type extinguisher or one approved 35-pound carbon dioxide extinguisher.

(2) One approved 2½-gallon foam-type, or one approved 15-pound carbon dioxide extinguisher for each 1,000 B. H. P. of the main engines, or fraction thereof.

(3) The total number of 2½-gallon foam-type or 15-pound carbon dioxide extinguishers carried in compliance with (2) shall not be less than two, and need not exceed six.

(4) When a donkey boiler fitted to burn oil as fuel is located in the machinery space, there shall be substituted for the 12-gallon foam or 35-pound carbon dioxide unit required by (1), one approved 40-gallon foam or one approved 100-pound carbon dioxide unit.

(g) On all passenger vessels there shall be provided in the machinery spaces, which contain electric propelling motors and generators of the open type, at least one 15-pound carbon dioxide extinguisher for each such electric propelling motor and generator unit.

(h) Carbon dioxide system requirements. (1) When a carbon dioxide (CO₂) smothering system is fitted in the boiler room, the quantity of carbon dioxide carried shall be sufficient to give a gas saturation of 25 percent of the gross volume of the largest boiler room from tank top to top of the boilers. Top of the boilers is to be considered as the top of the shell of a Scotch or leg type of boiler, and the top of the casing or drum, whichever is the higher, on water-tube boilers. The quantity of carbon dioxide required may be determined approximately by the following formula:

$$W = \frac{L \times B \times D}{36}$$

Where

W = the weight of CO₂ required in pounds

L = the length of the boiler room in feet.

B = the breadth of the boiler room in feet

D = the distance in feet from tank top or flat forming lower boundary to top of boilers

(2) When a carbon dioxide (CO₂) smothering system is fitted in the machinery space

of vessels propelled by internal combustion engines, the quantity of carbon dioxide required may be determined approximately by the following formula.

$$W = \frac{L \times B \times D}{22}$$

Where

W = the weight of CO_2 required in pounds

L = the length of machinery space in feet

B = breadth of the machinery space in feet

D = distance in feet from tank top or flat forming lower boundary to the underside of deck forming the hatch opening

(3) The whole charge of gas shall be capable of being released simultaneously by operating one valve and control. All cylinders shall be completely discharged in not more than two minutes. The arrangement of the piping shall be such as to give a general and fairly uniform distribution over the entire area protected. An alarm which shall operate automatically with the operation of the system shall be provided to give a warning in the space when the carbon dioxide is about to be released. Provision shall be made to prevent the admission of air into the lower parts of the boiler or engine room while the system is in operation.

(i) Foam smothering system requirements (1) When a foam-type system is fitted, its capacity shall be such as to rapidly discharge over the entire area of the bilge (tank top) of the largest boiler room a volume of foam 6 inches deep. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected. The system shall be completely discharged in not more than 3 minutes.

(2) The foregoing system may be of a type employing either two-solution tanks or one or more generators using an approved dry chemical mixture. All containers and valves by which they are operated shall be easily accessible and so placed that they will not readily be cut off from use by an outbreak of fire.

(j) Fixed water spray system (1) When a fixed system is fitted for spraying water on oil in bilges, its capacity shall be such as to blanket the entire area of the bilge (tank top) of the largest boiler room with an adequate supply of water.

(2) The arrangement of piping and nozzles shall be such as to give a uniform distribution over the entire area protected. The piping system for each space protected shall be in one unit, unless otherwise specifically approved by the Commandant.

(3) All valves by which the system is operated shall be located outside of the space protected and shall be easily accessible. Suitable means shall be provided to prevent the passage of foreign substances into the spray nozzles.

(4) The primary source of supply for the system shall be from a pump or pumps of suitable capacity and pressure. The pump or pumps shall be reserved for this purpose only. This pump or pumps shall be located outside of space protected.

61.15 Water sprinkling system On and after December 31, 1916, all steamers carrying passengers, and which also carry freight upon the main deck which is accessible to passengers or crew while being navigated, shall have installed in such main-deck freight space an efficient overhead water-sprinkling system.

The crew and passenger sleeping accommodations located below the main deck on steamers engaged in the passenger traffic shall have installed therein an efficient overhead water-sprinkling system, unless such quarters and the bed frames therein are constructed of metallic or noncombustible material, thereby making them practically fireproof.

On steamers carrying passengers where the kitchens or galleys are located below the

main deck, there shall be installed in such kitchens or galleys an efficient overhead water-sprinkling system. This paragraph shall become effective July 1, 1917.

The water-sprinkling system above referred to shall be reliable and efficient and so located that the volume of discharge shall be sufficient to entirely cover or blanket the freight in case of fire, and to entirely and fully sprinkle the compartment in which the passengers or crew may be accommodated below deck, and be installed in such manner as to be easily and quickly accessible of operation, and shall be ready for service at all times when freight or passengers are on board. The operating valves for the sprinkling system shall be suitably marked.

61.16 Fire-detecting, alarm, automatic sprinkler, and patrol systems, new and existing vessels. (a) (1) All passenger vessels with berth or stateroom accommodations for 50 or more passengers shall be fitted, unless deemed unnecessary by the Commandant for the proper protection of life, with an automatic water-sprinkling system of a type approved by the Commandant, which system shall be so installed as to protect all enclosed parts of the vessel accessible to passengers or crew while the vessel is being navigated, except cargo holds, machinery spaces, and when of fire-resisting construction, toilets, bath rooms, and spaces of similar construction.

Where, in the case of a particular vessel, the Commandant does not consider the installation of an automatic water-sprinkling system necessary, such vessel shall be protected in such enclosed parts of the vessel as the Commandant shall deem necessary, with an automatic electric or pneumatic fire-detecting and alarm system, used singly or in combination, of a type approved by the Commandant.

(2) All passenger vessels of more than 150 feet in length having berth or stateroom accommodations for less than 50 passengers, shall be fitted with an automatic fire-detecting and alarm system of a type approved by the Commandant. Such system may be electric, pneumatic, automatic sprinkler or a combination of each.

(b) (1) All passenger vessels having berth or stateroom accommodations for passengers shall be provided with an efficient supervised fire patrol system of an approved type which will record the time of each visit to each recording station, unless the stations are so interrelated as to require operation of all stations of a route in a fixed order, in which case the record shall show the time of start and finish of each tour.

(2) The date of both the night and morning portions of the patrol shall be entered on the record. The records shall be available for review by inspectors for a period of 6 months after the date to which such records refer.

(3) The station boxes shall have seals placed over the securing screws in order to leave evidence of removal or tampering. The number and location of recording stations, the order in which they are visited, and the number undertaken by one patrolman shall be approved by the Commandant.

(4) Where the system is not equipped with a recording apparatus in the control station¹ the patrolman shall report to the bridge every hour.

(c) All passenger vessels of more than 150 feet in length having berth or stateroom accommodations for passengers which are not equipped with a fire-detecting system in cargo spaces, shall be equipped with an approved smoke detecting system in all cargo spaces which are inaccessible to passengers or crew while the vessel is being navigated. Cargo spaces which are accessible to passengers or crew while the vessel is being navigated shall be equipped with a water-sprinkling system.

(d) All passenger vessels with sleeping quarters for passengers shall be provided with an approved manual fire alarm system which operates alarm bells in the pilothouse, engine

¹ Those stations in which a 24-hour watch is maintained and in which, (1) navigating equipment is located, or (2) radio equipment is located, or (3) central fire station where fire recording instruments are located.

room, and emergency squad quarters where provided. The manual fire alarm system shall be installed in accordance with the plans approved by the Commandant and shall have a suitable number of stations on all decks so as to enable the patrolman to give the alarm immediately in case of fire.

61.17 Fire-detecting and automatic sprinkling systems—(a) Provisions common to all systems—(1) General (i) All devices and equipment installed shall be of a type and character suitable for marine use, and shall be approved by the Commandant.

(ii) In addition, parts and samples of any equipment shall be submitted by the manufacturers for test purposes, upon request of the Coast Guard.

(iii) Furthermore, all apparatus, devices, and circuits of/as a complete system shall withstand a 60-day endurance test without repair, one-half of which time shall be at sea service.

(iv) Fire-alarm systems shall not be used for the transmission of other than fire-alarm signals.

(v) Systems shall be normally free of electrical grounds.

(vi) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the American Institute of Electrical Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions. All conductors shall be lead sheathed to protect against moisture and conductors exposed to mechanical injury shall be leaded and armored. Lead-sheathed conductors may be used for voltages of 60 volts or less. In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermostats in each thermostat zone, but approved multiconductor cable may be used to connect the several individual zones to the annunciator panel.

(2) Maintenance and test (i) With each equipment there shall be furnished a framed chart which shall be visible in the wheelhouse at all times, bearing full instructions for operation, maintenance, and test of the system.

(ii) This chart shall bear tabulated spaces for the date and signature of a licensed officer of the ship who shall witness or conduct tests of the system at intervals not less frequent than required in the specification forming part of the Commandant's approval. It is recommended that periodic inspections be made by the manufacturer of the equipment.

(iii) The chart shall list the minimum spare material which is required in each equipment in the specification forming part of the Commandant's approval.

(3) Classification Protection shall be provided by systems of the following types, used singly or in combination.

(i) Electrical system, using thermostats or thermostat wire operating by heat to produce visual and audible signals.

(ii) Pneumatic-tube system, using thermostats composed of copper tubing containing air, the expansion of which produces visual and audible signals.

(iii) Smoke-pipe system, in which fire is indicated visually and by the sense of smell by smoke drawn through pipes and suitably illuminated.

(b) Electrical and pneumatic-tube systems—(1) Scope of installations (i) For vessels 150 feet and under in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or in the engine room.

(ii) For vessels above 150 feet and under 350 feet in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or chart room; and shall provide an auxiliary audible alarm in the engine room.

(iii) For vessels 350 feet or more in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator

ator, together with an alarm bell, to be located in the wheelhouse or chart room or in a fire station in which a 24-hour watch is kept, and shall provide an auxiliary audible alarm in the engine room

(1v) Annunciators or other indicators shall be clearly marked to show the fire-alarm circuit protected and shall indicate or function until manually restored

(2) **Location of detectors, electrical system** (i) Detectors (thermostats) shall be installed overhead in the high point of each compartment protected. At least one detector shall be installed in each such compartment. Detectors (thermostats) shall not be approved for use in cargo compartments or other inaccessible places after June 30, 1933, unless satisfactory provision is made to replace them without ingress to the compartment in which they are located

(ii) On smooth ceilings detectors shall be spaced not over 15 feet apart and the area protected by a single detector shall not exceed 200 square feet, and no point on the ceiling shall be more than 10 feet away from the detector. For the detectors of the wire type each circuit shall consist of a continuous length of thermostat wire not exceeding 1,000 feet in length. The thermostat wire shall extend into each compartment protected and no point on the ceiling shall be more than 10 feet away from the thermostat wire

(iii) Thermostat wire shall be run directly on the ceiling or within 12 inches of the ceiling on partitions or bulkheads. In cargo compartments all fire-indicating apparatus shall be installed overhead and not on the ship's side or on bulkheads

(iv) Ceilings divided into panels or bays by beams not more than 8 inches deep shall be regarded as smooth ceilings, otherwise each bay shall be regarded as a separate ceiling

(v) Where these spacing requirements are impracticable because of unusual beam structures, special instructions shall be obtained from Headquarters

(vi) All detectors in cargo spaces, or otherwise subject to mechanical injury, shall be suitably protected by substantial steel protectors crossing over in front of detectors and fastened to beams or brackets or the equivalent

(vii) As required by the Coast Guard, from 3 to 6 spot thermostats for fire-detecting systems installed prior to January 1, 1935, and at subsequent intervals, shall be supplied for test purposes and if found lacking in sensitivity the entire installation of thermostats shall be replaced

(3) **Location of detectors, pneumatic-tube system** (i) Each circuit shall consist of a continuous length of pneumatic tubing, not exceeding 1,000 feet in length, without branches or alternative paths

(ii) Tubing shall be run directly on ceilings or within 12 inches of ceiling on partitions or bulkheads. In cargo compartments all fire-indicating apparatus shall be installed overhead and not on the ship's side or on bulkheads

(iii) In every inclosed space or separate room there shall be exposed at least 5 percent of total length of tubing or circuit

(iv) In no case shall less than 25 feet of exposed tubing be used in any inclosed space or separate room

(v) On smooth ceilings no point on the ceiling shall be more than 12 feet from nearest point of tubing

(vi) Ceilings divided into panels or bays shall be regarded as smooth ceilings, provided beams are not more than 8 inches deep, otherwise at least one line of tubing shall be run in each bay

(vii) Where these spacing requirements are impracticable because of unusual beam structures, special instructions shall be obtained from Headquarters

(viii) Where necessary, tubing shall be protected against mechanical injury

(ix) Tubing shall be inclosed in conduit or otherwise heat insulated where this is necessary in order to properly isolate signals

(4) Zoning (i) A single fire-alarm circuit shall not include more than 50 individual rooms or storage lockers

(ii) Spaces separated by watertight or main vertical zone bulkheads shall not be included in the same fire alarm zone. Further, a fire alarm zone shall not include spaces on more than one deck except in the case of peak spaces having a combined ceiling area not exceeding 3,000 square feet, or in the case of a system with indicators for individual spaces

(iii) Systems shall be so designed that one circuit becoming inoperative will not affect the operation of any other circuits

(iv) The system shall be so arranged as to permit one or any number of fire alarm signals simultaneously, and an alarm on any one circuit shall not interfere with the operation of any other circuit

(5) Supervision (i) The source of energy and all electrical circuits, except as hereinafter provided, shall be under constant electrical supervision. In event of failure of the source of energy or a break in any supervised circuit, a distinctive trouble signal or fire-alarm signal shall sound continuously until the trouble is corrected. No switch for silencing this signal shall be provided unless its operation transfers the signal to a trouble lamp

(ii) All trouble circuits, the source of energy for trouble circuits, and normally open secondary circuits on control panels incased in metal protection need not be supervised

(iii) The thermostats themselves need not be supervised if connected in multiple

(iv) A fire gong shall be supervised. When multiple fire gongs are used, at least one shall be supervised

(6) Current supply (i) The source of energy for the fire-alarm system, including supervisory circuits, shall consist of a storage battery of sealed cells automatically charged from the main bus bars of the lighting system, and used for no other purpose

(ii) The supply voltage shall be not less than 20 volts. The system shall be able to operate at 80 percent of normal voltage

(iii) The capacity of the storage battery shall be sufficient to supply the system for at least 48 hours without recharging, and shall be not less than 10 ampere hours

(7) Fuses Approved fuses of not less than 3-ampere nor more than 6-ampere capacity shall be provided at or near the bus bars from which the charging current is taken and on charging panel in main discharge leads of battery

(8) Control panels and devices (i) All panels and devices shall be capable of operating when inclined to an angle of 45°. Operation shall not be affected by vibration

(ii) Audible signals shall be produced on vibrating fire-alarm bells of inclosed type with gongs not less than 6 inches in diameter

(iii) Provision shall be made for silencing the fire-alarm bell by means of a switch operating when the door of the control-panel cabinet is open at least 3 inches, or by equivalent means

(c) Smoke-pipe systems—(1) Scope of installations Systems of this type shall provide a detecting device to which all smoke pipes shall lead, which device shall be located in the wheelhouse, in a fire control station in which a 24-hour watch is kept, or in convenient proximity to the valves of the extinguishing system, provided there are transmitted to the wheelhouse or fire control station means for determining the compartment reporting the alarm and audible alarms are provided as required in this section

(2) Construction and installation. (i) The detecting device shall be such that finely divided and diluted particles of smoke shall be readily indicated visually. The lighting arrangement shall be such as not to be disturbing to navigation at night. For new installations on vessels of over 5,000 gross tons or where installations are not made in the wheelhouse or fire control station, this device shall be provided with an audible alarm in the wheelhouse together with an auxiliary audible alarm located in the engine room

(ii) Smoke collectors shall be installed overhead in each compartment protected and shall be so located that no point on the overhead deck is more than 40 feet from a collector. The indicating pipes or tubing shall be not smaller than three-fourths inch inside diameter. When more than one smoke collector is required for a compartment, not more than two collectors may be connected to one indicating pipe. Each compartment shall have one or more indicating pipes extending to the detecting device, except that the pipes from small adjacent compartments not exceeding a combined volume of 5,000 cubic feet may be joined. No smoke collectors shall be located nearer to the edge of the opening of a ventilator than three times the diameter or equivalent diameter of the opening.

(iii) Sufficient quantity of the exhaust shall discharge into the wheelhouse or fire station to permit the detection of fire by odor, and a valve plainly marked and readily operable from that compartment shall be provided to duct the exhaust, if obnoxious, to the outside. Where the detecting cabinet is not installed in the wheelhouse or fire station the residual exhaust shall be discharged in the vicinity of the detecting cabinet.

(iv) Suction fans shall be furnished in duplicate, and shall be provided with switches to permit their operation from the emergency lighting circuit. Where the emergency lighting voltage is less than the normal lighting voltage, one fan shall be so arranged that it may be operated from either source.

(v) A trouble signal located in the fire control station or the wheelhouse shall be provided which will indicate the inability of the system to report a smoke alarm.

(vi) Where exposed to injury in cargo compartments the collectors and smoke pipes shall be reasonably protected against injury.

(vii) All smoke pipes shall be installed to grade to low points and at low points provided with drains. These pipes shall be run with as easy bends as practicable.

(viii) The smoke inlets in cargo holds should be examined periodically by the ship's personnel to determine whether inlets are obstructed by corrosion, paint, dust, or other extraneous condition. Smoke tests should be made in all holds and the operation of the system noted.

(d) Automatic sprinkling system. (1) The sprinkling system shall, where practicable, consist of pipe fitted with sprinkler heads at suitable distances that will operate automatically in the event of a fire, and spray water on the surrounding area.

(2) The system shall be supplied primarily by a pressure tank or tanks of suitable capacity and maintained at the required pressure, and secondarily by an automatically controlled pump so arranged that when the pressure in the tank falls to a predetermined point the pump will cut in. Where a motor-driven sprinkler pump is installed, it shall be capable of being operated from the emergency electrical circuit in case of failure of the main power. Any water standing in the system or the tank should be fresh, and in the event the supply to the pump is salt water, appropriate check valves shall be installed to prevent the salt water entering the tank. Provision should be made to cut in any additional pumping equipment under manual control.

(3) Sprinkler systems shall be zoned, and means shall be provided for giving an alarm where it can be most quickly observed by officers or crew in case of water flow from sprinklers, low air pressure, closed supply valves or operation of thermosensitive elements.

(4) The automatic sprinklers, alarm valves, and other fire-protection devices to be used in the above system shall be of a type approved by the Commandant, and the entire system shall be installed in accordance with drawings and specifications approved by the Commandant.

(5) All tanks installed on or after January 1, 1939, for use in connection with sprinkler systems shall be constructed, tested, and inspected as unfired pressure vessels in accordance with the provisions of parts 50 to 57, inclusive, of this chapter. All such tanks which were installed prior to January 1, 1939, shall be tested and inspected as unfired pressure vessels in accordance with the provisions of parts 50 to 57, inclusive, of this chapter.

61 18 Oxygen-breathing apparatus, gas masks, and flame-safety lamps All passenger vessels which are provided with sleeping quarters for passengers shall be provided with oxygen-breathing apparatus, gas masks, and flame-safety lamps, as follows

(a) Vessels with 50 to 100 staterooms for passengers, 4 oxygen-breathing apparatus or 4 gas masks

(b) Vessels with more than 100 staterooms for passengers, six oxygen-breathing apparatus or six gas masks and a flame-safety lamp

(c) Oxygen-breathing apparatus or gas masks shall be kept in operative condition and in the following places Vessels coming under paragraph (a), two shall be in the pilothouse, one in the engine room, one in wireless room Vessels coming under paragraph (b), three shall be kept in the pilothouse, two in engine room, one in wireless room

(d) The master and chief engineer shall train a sufficient number of officers and crew in their respective departments in the use of the equipment

(e) Only oxygen-breathing apparatus and flame-safety lamps that have been approved by the Commandant may be used

(f) Oxygen-breathing apparatus shall be of at least one-half hour period type, and gas masks shall have the approval of the Commandant

(g) One extra cylinder for each oxygen-breathing apparatus and one extra canister for each gas mask shall be carried

(h) The gas mask mentioned above shall be of an approved type which provides full protection against carbon monoxide and other gases

(i) All vessels equipped with refrigeration of any kind shall carry one gas mask of a kind giving protection against the refrigerant used, in addition to the breathing apparatus

(j) Vessels engaged in international voyages, at least two oxygen-breathing apparatus and two flame-safety lamps, inclusive of the requirements of (a) or (b), if applicable One breathing apparatus and flame-safety lamp shall be in the pilothouse, the other apparatus and lamp in such place as the master may designate

61 20 Lubricating oils Lubricating oils for use on board the vessel shall be stored in secure tanks, casks, or cans in the engine-room compartments or storeroom, or in metal-lined lamp lockers or oil rooms Effective on and after April 9, 1941

61 21 Fire extinguishers for emergency power plants In compartments where emergency lighting and wireless units are located, two approved fire extinguishers of either carbon tetrachloride, carbon dioxide, or foam type shall be permanently located at the most accessible points In addition, two fire extinguishers of the above types shall be permanently located so as to be readily accessible to the emergency fuel tanks containing gasoline, benzene, or naphtha

61 22 Fire-resisting bulkheads On and after July 1, 1931, all passenger vessels shall be fitted above the bulkhead deck with fire-resisting bulkheads which shall be continuous from side to side of the vessel and arranged to the satisfaction of the Commandant The mean distance between any two adjacent fire-resisting bulkheads in any superstructure shall, in general, not exceed 131 feet For additional requirements see Part 144—Construction or Material Alteration, of Passenger Vessels of the United States of 100 Gross Tons and Over Propelled by Machinery, Chapter II, Title 46, Code of Federal Regulations.

61.23 Construction of motion picture booths—(a) Booths. Apparatus for projecting motion pictures using inflammable (nitrocellulose) film or slow-burning (acetate cellulose) film shall be contained in a fire-resistive booth or inclosure It shall be not less than 7 feet in height and of horizontal area not less than 30 square feet for each projector It shall not be located nearer than 10 feet to the principal exits of the room

(1) **Construction of booth.** The framework shall be constructed of structural steel angles or T irons not less than 1½ inches by 1½ inches by ¼ inch, spaced not more than 2 feet apart, or 2 inches by 2 inches by ¼ inch, when spaced from 2 feet to 4 feet apart, and shall be

suitably braced to withstand lateral strains. It shall be securely anchored to the deck. The top and sides of the booth shall be covered on the inside of the steel frame with a metal sheet not thinner than No. 20 gage, inside of which is placed asbestos millboard not less than one-fourth inch thick, all properly secured to the framework. Transite asbestos boards or asbestos wood may be used without the sheet-metal covering, provided the distance between supports for the $\frac{1}{4}$ inch thickness does not exceed 2 feet, for the $\frac{3}{8}$ inch thickness, 3 feet, for the $\frac{1}{2}$ inch thickness, 4 feet. The door shall be constructed similar to the booth, and shall be not less than 2 feet wide and 5 feet high, shall be self-closing, fit its frame tightly, and be provided with proper latches. The floor shall be covered with one thickness of three-eighth-inch asbestos millboard or transite board.

All joints shall be made smoke proof.

(2) **Openings in booth.** The booth shall be provided with a ventilating inlet on each of the three sides, each to be about 15 inches long and 3 inches high, covered on the outside with wire netting of mesh not greater than $\frac{1}{8}$ inch, securely fastened to the wall. In the top of the booth shall be located an air-outlet opening of not less than 100 square inches for each projector connected by a fire-resistive flue to a safe distance above the top deck if the booth is located below deck. The flue shall be securely supported on the framework of the booth. This is designed to provide for an air current through the booth, when operating, of 30 or more cubic feet per minute. If in the given location this is not accomplished, artificial ventilation, as by means of a fan within the booth, shall be introduced.

Two openings shall be provided at the front of the booth, one for the machine and the other for observation by the operator, the maximum area of each opening not to exceed 70 square inches. These openings as well as the air inlets near the bottom of the booth shall be provided with gravity doors made of iron or steel not less than $\frac{3}{8}$ inch in thickness, of size to overlap the openings by at least 2 inches, and arranged to slide without binding in properly constructed grooves, the joint between door and wall to be smoke-tight when doors are closed, said doors to be held open normally by the use of a fine combustible cord fastened to a fusible link located above the projector which melts at a temperature of 71° C (160° F), the whole being so arranged that the doors will close automatically upon severing of the cord or the fusing of the link. Provision shall also be made for closing said doors by hand from the outside of the booth.

(3) **General requirements.** All films on board shall at all times be kept within the operating booths, except as otherwise herein provided. They shall be contained in individual metal boxes, except for the film in the machine and the film immediately before it is placed in or immediately after removal from the machine. Where not over five 5-pound reels are present in the booth they may be placed on incombustible shelves, suitably secured against displacement by the motions of the boat. Where more than 5 reels but not more than 10 reels are present, they shall be kept in closed shelves or cabinets similar in construction to that of the walls of the booth. Where more than ten 5-pound reels are present, they are to be stored in an insulated film cabinet, the cabinet to be constructed per appended specifications.

All rewinding and repair of film shall be conducted within the projecting booth, unless a place with equal safeguards is provided.

When in use the door of the booth shall be closed and when not in use it shall be locked.

The projecting machine is to be suitably secured against displacement by the motions of the boat. All electric wiring and connections shall conform with accepted standards for the given purpose (National Electric Safety Code or National Electric Code). No smoking, matches, or lights other than properly guarded electric lights shall be permitted within the booth.

(b) **Cabinets.** (1) The size of a cabinet for the temporary storage of films on board shall not exceed 10 cubic feet, and shall not be used for storage at one time of more than forty

5-pound reels The reels shall be contained within suitable metal containers and be held on racks in such manner as not to be displaced by the motions of the boat

(2) The cabinet shall be constructed of incombustible materials throughout and shall be tightly enclosed. It may be of sheet iron of not less than No 18 U S gage, stiffened with angle irons, double walled, with not less than 2 inches of space between walls, filled with incombustible insulating material, or equivalent construction. The door shall be constructed equivalent to the walls of the cabinet, shall be self-closing, fit closely, and be kept closed and locked at all times except when films are being removed from or placed in the cabinet. If the cabinet is located within the booth, the door of the cabinet shall open outward through the wall of the booth, with tight joints between the booth wall and the cabinet or door. The cabinet shall otherwise be kept in a hold for the storage of hazardous materials. The cabinet shall be secured to the deck by fastenings attached to the outer angle irons.

(c) **Fire extinguisher required** At least one fire extinguisher of a kind approved by the Commandant shall be placed near every such booth and be accessible at all times.

(d) **Motion-picture projectors** (1) Motion-picture projectors of the 16 mm or 8 mm size, using only slow-burning films, need not be of an approved type and may be used on inspected vessels without booths.

(2) Motion-picture projectors using the 35 mm size films shall only be used in booths, constructed in accordance with the specifications in paragraph (a) of this section and must be of an approved type.

61 24 Regulations to guard against and extinguish fire reestablished The regulations in this part to guard against and extinguish fire, in effect on April 8, 1941, established under the authority of Title 52 of the Revised Statutes of the United States (R S Sections 4399—4500, inclusive), are hereby reestablished under the authority of section 2 (a) of the Act of October 9, 1940 (46 U S C 463a), and effective on and after April 9, 1941.

61 25 Liquefied petroleum gases for cooking and heating—(a) Liquefied petroleum gas (definition) For purposes of this section "liquefied petroleum gas" shall be defined as any liquefied inflammable gas which is composed predominantly of hydrocarbons or mixtures of hydrocarbons, such as propane, propylene, butanes, butylenes, and butadienes, and which has a Reid¹ vapor pressure exceeding 40 pounds per square inch absolute or a vapor pressure exceeding 25 pounds per square inch gage at 100° F, as determined by the Natural Gasoline Association of America's² method or other recognized test method.

(b) **Approvals** Liquefied petroleum gas may be used on inspected vessels, except passenger vessels. *Provided,*

(1) Gas consuming appliances are approved for use of liquefied petroleum gas by the American Gas Association Testing Laboratories (as indicated by label or seal of approval for liquefied petroleum gas on stationary installations) and are also approved by the Commandant.

(2) Cylinders or drums in which liquefied petroleum gas is stored and handled shall comply with Interstate Commerce Commission specifications and retest requirements for the specific gas filled therein.

(3) The relief valves, shut off valves, excess flow valves, pressure regulators, and vaporizer, when used, shall conform to the requirements of and bear the label of the Underwriters Laboratories, Inc, or other recognized testing laboratory.

(4) The location and installation of gas burning appliances, gas cylinders and regulating equipment, together with all piping must be approved by the Commandant.

¹ American Society for Testing Materials Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method) (D-323), most recent revision.

² Natural Gasoline Association of America Tentative Standard Method for Determination of Vapor Pressure of Liquefied Petroleum Gas Products, most recent revision.

(c) **Odorization of gas** All liquefied petroleum gas used on vessels shall be effectively odorized by an agent of such character as to indicate positively by a distinctive odor the presence of gas down to a concentration in air of not over one-fifth the lower limit of combustibility

(d) **Location and security of containers** (1) Cylinders shall be located in a substantially constructed and firmly fixed metal inclosure located on or above the weather deck level. Access to this inclosure shall be from the weather deck only. This inclosure shall be so constructed that when the access opening is closed any gas leakage can escape only through a top and bottom ventilating system which shall consist of a fresh air inlet pipe and an exhaust pipe both entering the inclosure from above

(2) Cylinders or drums located within the metal inclosure shall be suitably secured in place

(3) Storage of spare and empty cylinders must be within the metal inclosure or they must be properly chocked on the weather deck

(e) **Valves and regulators** (1) A spring loaded relief valve shall be incorporated in the system, its size and pressure setting to be according to Interstate Commerce Commission's requirements, and it shall be located and vented within the metal inclosure. This relief valve must be located on or between the cylinder and the pressure regulator

(2) The low pressure side of all pressure regulators shall be protected against excessive pressure by means of a suitable relief valve which shall discharge into the metal inclosure

(3) All regulator vents must discharge into the metal inclosure

(4) All valves and regulators embodied in the system for the purpose of pressure relief, regulation, and control of gas pressure and flow rates, shall be securely mounted in positions readily accessible for inspection, maintenance, and testing

(5) Valves in the assembly of multiple cylinder systems shall be so arranged that the change of cylinders may be made without shutting down the system

(6) A shut off valve shall be installed in each branch connection

(f) **Vaporizers.** Where a vaporizer is required approval shall be obtained from the Commandant

(g) **Piping and fittings** (1) All piping shall be installed so as to provide minimum interior runs with adequate flexibility

(2) The piping between the cylinders and the appliances shall be seamless annealed copper tubing or any other tubing approved by the Commandant. The tubing connections shall be flared and the number held to a minimum

(3) All piping or tubing shall be tested (such as with a manometer employing water) after assembly and at each annual inspection and proved free from leaks at not less than normal operating pressures. Tests may be made by qualified persons acceptable to the Officer in Charge, Marine Inspection, and one copy of a report of such test shall be posted and another copy forwarded to the Officer in Charge, Marine Inspection, in the district in which the test was made

(h) **Ventilation of compartments having gas appliances.** (1) Compartments which are located above the weather deck and which contain gas consuming devices shall be ventilated by openings to the outside near the deck level and by openings overhead or near the overhead in the compartment. Mechanical ventilators may also be provided

(2) Where compartments in which gas consuming devices are located are entirely below the weather deck, mechanical ventilation shall be provided with sufficient capacity to effect a change of air at least once every 6 minutes.

(1) **Identification and instructions** (1) The outside of metal inclosure housing liquefied petroleum gas cylinders, valves and regulators shall be marked

Liquefied Petroleum Gas
Keep Open Fires Away
Operating Instructions
Inside and In-----

(2) Operating Instructions shall be framed under glass and shall be posted prominently, both in the interior of the metal inclosure and near the most frequently used gas consuming device so they may be easily read

(j) **Operating instructions** (1) Before opening a cylinder valve, the outlet of cylinder shall be connected tightly to system, and, in the case where only a single cylinder is used in the system, all appliance valves and pilots must be shut off before the cylinder valve is opened

(2) Before opening cylinder valve after connecting it to system, the cylinder shall be securely fastened in place

(3) When cylinders are not in use their outlet valves shall be kept closed

(4) Cylinders when exhausted shall have their outlet valves closed

(5) Nothing shall be stored in the metal inclosure except liquefied petroleum gas cylinders and permanently fastened parts of the system

(6) Valve protecting caps if provided shall be firmly in place on all cylinders not attached to the system. Caps for cylinders in use may remain in metal inclosure if rigidly fastened to the metal inclosure structure

(7) The opening into the metal inclosure must be closed at all times except when access is required to change cylinders or maintain equipment

(8) Gas pressure to consuming devices should be approximately eleven inches water column (6.4 oz per sq in)

(9) No smoking should be permitted in the vicinity of the metal inclosure when access to inclosure is open

(10) If electric connections are made within the metal inclosure they must be installed in strict accordance with the requirements of the National Electrical Code¹ for class I, group D, hazardous locations

(11) Tests for gas leaks should be made with a soap solution or low freezing point liquid, but in no case shall a flame be used

(12) Report any presence of gas odor to-----

¹ A copy of this code National Board of Fire Underwriters' pamphlet No. 70, has been filed with this document in the Division of the Federal Register. Copies are also on file with the various Coast Guard district commanders for reference purposes

PART 62—SPECIAL OPERATING REQUIREMENTS

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NOTE The rules and regulations regarding the examinations for and the issuing of licenses, certificates, raising of grade, etc., and other matters relative to merchant marine personnel are contained in a separate publication entitled, "Rules and Regulations for Licensing and Certifying of Marine Personnel."

Section 62.12a Notice to mariners, aids to navigation (a) Licensed officers are required to acquaint themselves with the latest information published by the Coast Guard and the United States Navy regarding aids to navigation, and neglect to do so is evidence of neglect of duty. It is desirable that vessels navigating oceans and coastwise and Great Lakes waters shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners. All vessels shall have charts of the waters on which they operate available for convenient reference at all times.

(b) Notice to Mariners published weekly by the Coast Guard which contains announcements and information regarding aids to navigation and charts of waters of the United States is available for free distribution at the following places: Field offices of the Coast Guard, United States Coast and Geodetic Survey field stations, and the Marine Division, Customhouse. Notice to Mariners published weekly by the United States Navy for the correction of charts, sailing directions, light lists and other publications, and which includes foreign waters and certain waters of the United States, is available for free distribution at the Hydrographic Office, Branch Hydrographic Offices, or any of the agencies of seaboard ports, and is also on file in the United States consulates where they may be inspected.

62.16 Notice of casualty and voyage records (a) The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the U S Coast Guard whenever the casualty results in any of the following

- (1) Damage to property in excess of \$1,500
- (2) Material damage affecting the seaworthiness or efficiency of a vessel
- (3) Stranding or grounding
- (4) Loss of life
- (5) Injury causing any persons to remain incapacitated for a period in excess of 72 hours

(b) The notice required in the above paragraph shall show the name and official number of the vessel involved, the owner or agent thereof, the nature and probable cause of the casualty, the locality in which it occurred, the nature and extent of injury to persons and the damage to property

(c) In addition to the notice required above, the person in charge of the vessel shall, as soon as possible, report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival *Provided*, That when from distance it may be inconvenient to report in person it may be done in writing only The written report required herein for personal accident not involving death shall be made on Form CG-924E and for all other marine casualties or accidents the written report shall be made on Form CG-2692

NOTE If filed without delay these forms may also provide the notice required by paragraph (a) of this section

(d) The owner, agent, master, or other person in charge of any vessel involved in a marine casualty shall retain such voyage records of the vessel as are maintained by the vessel, such as both rough and smooth deck and engine room logs, bell books, navigation charts, navigation work books, compass deviation cards, gyrocompass records, stowage plans, record of draft, aids to mariners, radiograms sent and received, the radio log and crew and passenger lists The owner, agent, master, or other officer in charge, shall make these records available to a duly authorized Coast Guard officer or employee for examination upon request

(e) Whenever a vessel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection No report on Form CG-2692 is required unless any of the results listed in paragraphs (a) (1) to (a) (5), inclusive, of this section occurs

62.17 Persons allowed in pilothouse and on navigation bridge. Masters and pilots of vessels carrying passengers shall exclude from the pilothouse and navigator's bridge of such vessels, while under way, all persons not connected with the navigation of such vessels *Provided*, That inspectors of the Coast Guard, licensed officers of vessels, persons regularly engaged in learning the profession of pilot, officers of the Coast Guard, United States Navy, United States Coast and Geodetic Survey, and the Engineer Department of the United States Army, may be allowed in the pilothouse or upon the navigator's bridge upon the responsibility of the officer in charge

The master of every such passenger and ferry vessel shall keep three printed copies of this section posted in conspicuous places on such vessel, one of which shall be kept posted in the pilothouse

Such printed copies shall be furnished by Headquarters to Officers in Charge, Marine Inspection, for distribution

62.18 Station bills, drills, and reports of masters—(a) **Station bills and muster lists.** It shall be the duty of the master of every vessel carrying passengers and all other vessels of over 500 gross tons and subject to inspection to cause station bills and muster lists to be prepared before the vessel sails which shall be signed by the master who shall be responsible for their preparation The station bills and muster lists shall be posted in conspicuous

places in several parts of the vessel, particularly in the crew's quarters, and must contain full particulars of the signals which will be used for calling the crew to their stations for emergency duties. Special duties shall be allotted to each member of the crew and the muster lists shall show all these special duties and indicate the station to which each man must go and the duties he has to perform. The special duties should, as far as possible, be comparable to the regular work of the individual. On passenger vessels where the size of the crew will permit, several members of the crew should be designated as an emergency squad and required to report to the bridge with certain equipment for instructions. The duties provided for by the muster lists should include

(1) The closing of airports, watertight doors, fire doors, and fire screens, the covers and all valves of all scuppers, sanitary and other discharges which lead through the ship's hull below the margin line, and stopping the fans and ventilating systems

(2) The extinction of fire

(3) The equipment of boats, rafts, and buoyant apparatus and their preparation for launching

(4) The muster of passengers

(i) Warning the passengers

(ii) Seeing that they are dressed and have put on their life jackets in a proper manner

(iii) Assembling the passengers and directing them to the appointed stations

(iv) Keeping order in the passages and on the stairways and generally controlling the movements of the passengers

(b) Emergency signals—(1) **Fire alarm signals** (i) The general fire alarm signal shall be a continuous rapid ringing of the ship's bell for a period not less than 10 seconds supplemented by the continuous ringing of the general alarm bells for not less than 10 seconds.

(ii) For dismissal from fire-alarm stations, the general alarm bells shall be sounded three times, supplemented by three short blasts of the whistle

(2) **Boat station or boat drill signals** (i) The signal for boat drill or boat stations shall be more than six short blasts and one long blast of the whistle, supplemented by the same signal on the general alarm bells

(ii) Where whistle signals are used for handling boats, they shall be as follows

(a) To lower boats, one short blast of the whistle

(b) To stop lowering the boats, two short blasts of the whistle

(c) For dismissal from boat stations, three short blasts of the whistle

(3) Other emergency signals The master of any vessel may establish such other emergency signal, in addition to the above, as will provide that all the officers and all the crew and passengers of the vessel will have positive and certain notice of the existing emergency

(c) Emergency squad (1) The master may organize a squad to be used for emergency duties (other than a general emergency), or crew practices, and the nature of the signals or other means for assembling the squad remains within the discretion of the master

(2) The signals used for the assembly of the emergency squad should not conflict with the navigational signals or the signals used for a general alarm

(d) Drills, tests, and inspection (1) It shall be the duty of the master or the mate or officer in command, once at least in each week, to call all hands to quarters and exercise them in discipline, and, weather permitting, in the unlashng and swinging out of the lifeboats, the closing of all hand or power-operated watertight doors which are in use at sea, closing all fire doors and fire screens, the use of fire pumps and all other apparatus for the safety of life on board of such vessels, with special regard for the drill of the crew in the method of adjusting life preservers and educating passengers and others in this procedure, and to see that all the equipments required by law are in complete working order for imme-

date use, the fact of exercise of the crew, as herem contemplated, shall be entered upon the vessel's log book

(2) The section relating to fire and boat drills contemplates that such drills shall be conducted precisely as though an emergency existed. To accomplish the purpose of this section, lifeboat covers and strongbacks shall be removed, plugs or caps put in place, boat ladders secured in position for use, painters carried forward and tended so as to provide a good lead and slack to hold the boat in position under the davits when in the water. The person in charge of each lifeboat or life raft should have a list of its crew and should see that the men under his orders are acquainted with their several duties. The hand pumps and fire pumps shall be operated long enough and a sufficient number of outlets used to insure that such equipment is in order and effectual. The motor and the hand-operated propeller gear of each lifeboat shall be operated for a period of not less than 5 minutes once at least in every 7 days, in order that it may be ready for service at any time. Such operation shall be a part of the lifeboat drill and the fact of such operation shall be made a part of the report of such drill. When oxygen-breathing apparatus, gas masks, or other special equipment is carried, certain members of the crew shall be trained in the use of the equipment.

(3) In passenger vessels in which the voyage exceeds 1 week in duration a complete lifeboat and fire drill shall be held before leaving port, and others thereafter at least once a week during the voyage.

(4) All hinged or power-operated doors in main transverse bulkheads which are used for access while the vessel is being navigated, shall be opened and closed daily while the ship is at sea, in order to test the efficiency of the indicators and mechanisms.

(5) The watertight doors and all mechanisms and indicators connected therewith, and all valves, the closing of which is necessary to make a compartment watertight, shall be inspected at sea at least once a week.

(e) **Log book entries.** The entries in the vessel's log book relating to the exercise of the crew in fire and boat drills shall state the day of the month and the hour when so exercised, length of time of the drill, number on the boats swung out, number of lengths of hose used, together with a statement of the condition of all fire and lifesaving apparatus, watertight door mechanisms, valves, etc.

(f) **Penalty.** For any neglect or omission on the part of the officer in command of such vessels to strictly enforce the provisions of this section, he may be proceeded against in accordance with the provisions of section 4450, R. S., as amended, looking to a suspension or revocation of his license.

(g) **Additional requirements.** (1) It shall be the duty of the inspectors to require the officers and crew of all such vessels to perform the aforesaid drills and discipline in the presence of said inspectors at intervals sufficiently frequent to assure the said inspectors by actual observance that the foregoing requirements of this section are complied with.

(2) The master of every passenger vessel shall report monthly the day and date of such exercise and drill, the number of lifeboats on board and the number on the boats that were swung out at each drill, the condition of the vessel and her equipments, and also the number of passengers carried. These reports shall be made to the office of the Coast Guard District Commander of the district where the vessel was last inspected. That officer will forward the reports to the Officer in Charge, Marine Inspection, in which district the vessel operated during the greater part of the month to which the report relates, through the office of the proper Coast Guard District Commander.

(3) Three copies of this section (Form 809a) shall be furnished every vessel carrying passengers and one to all other vessels to which this section applies, to be framed under glass and posted in conspicuous places about the vessel.

62.19 Vessels requiring licensed masters There shall be a duly licensed master on board every steam vessel of more than 150 gross tons, or seagoing motor vessel of 300 gross tons or over, whenever such vessel is under way, and also upon every ocean and coastwise seagoing merchant vessel of the United States propelled by machinery, and upon every ocean-going vessel carrying passengers, subject to the inspection laws of the United States

62.19a Manning of seagoing barges The determination as to whether a seagoing barge shall be manned or not shall be made by the Officer in Charge, Marine Inspection. Permission may be granted for such barges to operate unmanned when in the opinion of the Officer in Charge, Marine Inspection, manning is not necessary for the safe operation of the vessel and where it appears that the requirements of the rules as to lights, etc., will be met. In any case the certificate of inspection should specify whether or not the barge is to be manned, the number and grade of the crew, when carried, and the conditions of operation when no crew is required. These conditions may include limitations as to loading, route, cargo, season of operation, etc.

62.20 Alarm bells and loudspeaker systems—(a) Alarm bells—(1) New vessels All vessels over 100 gross tons the construction of which is begun on and after September 1, 1943, shall have all sleeping accommodations, public spaces, and machinery spaces equipped with a sufficient number of alarm bells so located as to warn all occupants. The system shall operate from a continuous source of electric energy capable of supplying the system for a period of at least 8 hours without being dependent upon the main, auxiliary or emergency generating plants. Each bell shall produce a signal of a tone distinct from that of other bell signals in the vicinity and shall be independently fused with each of these fuses located above the bulkhead deck. The bells shall be controlled by a manually-operated contact maker located in the pilothouse, or, if specific approval is given by the Commandant, in the fire control station. The characteristics of the contact maker shall be such that it possesses

- (i) Positive contact,
- (ii) Watertightness (when located in open spaces subject to weather),
- (iii) Means whereby its electrically open or closed position can be determined by sense of touch,
- (iv) Means to effect a make-and-break circuit for signaling, and
- (v) Self-maintaining contacts

(2) Existing vessels All existing vessels over 100 gross tons and such vessels the construction of which is begun prior to September 1, 1943, shall have all sleeping accommodations equipped with a sufficient number of alarm bells so located as to warn all the occupants. The alarm bells, if electric, shall be operated from an open switch from the pilothouse or bridge. The bells shall be of such size, character, and construction as to provide an alarm throughout the spaces for which they are provided.

(b) Loudspeaker systems (where required). All passenger vessels, the construction of which is begun after January 1, 1937, and certificated to carry 1,000 persons or more including officers and crew, and all existing passenger vessels on which lifeboats are stowed more than 100 feet from the navigating bridge, shall be equipped with a loudspeaker system which shall enable an officer on the bridge to broadcast separately or collectively to the following stations:

(1) Lifeboat stations, port and starboard. (The deck or decks on which lifeboats are stowed and from which they are launched.)

(2) Embarkation deck, port and starboard. (The deck or decks, designated by construction design or by the vessel's station bill, used for the embarkation of passengers and crew into lifeboats. If lifeboat stations are used for embarkation purposes, this requirement to be omitted.)

(3) **Main quarters for crew** (The quarters of the emergency squad, deck crew, and stewards assigned to passenger quarters)

(4) **Public spaces** (The spaces designated by the vessel's station bill where passengers and crew are to assemble in an emergency)

Speakers, designated by the Commandant, at lifeboat stations and on embarkation deck or decks, shall be arranged for two-way conversation with the bridge

The Commandant may, in special cases, exempt passenger vessels having a small number of especially accessible lifeboats stowed more than 100 feet from the bridge. However, no existing passenger vessel having lifeboats stowed more than 100 feet from the navigating bridge, and certificated to carry more than 200 persons including officers and crew, shall be exempted from this requirement

(c) **General specifications** (1) The loudspeaker system shall be of a type embodying rugged construction for marine use and simplicity of operation. The entire system shall be controlled from a single location on the bridge

(2) The type of system, method of operation, and installation to be as approved by the Commandant. Wiring to be of a type and character approved for new construction. Provision shall be made to maintain the operating voltage required for the system under conditions of variations in voltage up to 20 percent plus or minus in either the regular or emergency power supply. The system shall be so designed and installed that grounds, short or open circuits occurring at any point in the distribution system will disable not more than one loudspeaker and shall not reduce the volume on the remaining speaker more than three decibels

The amplifier system shall be so designed that grounds, short or open circuits on any part of the system will not cause overloading which will reduce the volume output more than three decibels or noticeably affect the quality of reproduction. The system shall be equipped with a call or attention signal, which shall be a distinctive note of about 1,500 cycles frequency. The frequency of the system shall be approximately 100/4,000 cycles, and to insure even reproduction of voice over this range, automatic volume control (not expanding type) shall be provided. Distortion not to exceed 10 percent. For alternating-current systems duplicate motor generator sets shall be provided and have automatic transfer between same. Indicating lights shall be installed in the control cabinet for indicating when a two-way speaker desires communication with the bridge. All metal parts for cabinets, panels, transformers, cases, shields, and any other metal parts subject to corrosion shall be cadmium-plated or protected by other suitable means, the method of which is to be approved by the Commandant. Soldered joints are not to be used except where absolutely necessary and must be made with rosin flux and coated with an insulating varnish that is not subject to the action of salt water. Speakers in outside locations to be mounted in metal boxes or cases with suitable baffles, so constructed that they are protected against water but open for sound emission. Speakers in inside locations to be mounted in metal boxes or cases for protection, with latticed front for sound emission. All speakers to be of the dynamic cone type, with permanent magnetic field

(3) The system shall be used at the discretion of the master and shall function entirely independent of any public address or music distribution system, and the system shall not be used for entertainment purposes

(d) **Approval.** (1) Plans, including drawings of equipment, wiring diagrams, and detailed technical specifications, shall be submitted to the Commandant for comment and approval

(2) All items of equipment, including amplifiers, microphones, loudspeakers, and control apparatus, shall be of a type that has been tested and approved for such service by the Commandant. Before the loudspeaker system fitted on a particular vessel is approved, it shall be submitted to tests to be conducted by inspectors

(3) Vessels shall be provided with a complete set of installation plans and operating instructions and an adequate supply of spare parts to include at least the following 1 spare microphone, 100 percent vacuum tubes of all types used A reasonable supply of all damageable items, including relays, condensers, and loudspeaking units of each type

(4) The complete system shall be given an operating test at least once every week These tests shall be made by a licensed officer of the vessel and the condition of the equipment entered in the vessel's log

62 21 Steering gear tests On all ocean vessels under the jurisdiction of the Coast Guard making voyages of more than 48 hours' duration, the entire steering gear, the whistle, the means of communication and the signaling appliances between the bridge or pilothouse and engine room shall be examined and tested by a licensed officer of the vessel within a period of not more than 12 hours before leaving port All such vessels making voyages of less than 48 hours' duration shall be so examined and tested at least once in every week The fact and time of such examination and test shall be recorded in the ship's log book

62 21a Steering orders "Right rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the right

"Left rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the left

Where rudder indicators are provided, they shall be installed consistent with the foregoing

62.22 Unnecessary whistling. Unnecessary sounding of vessel's whistle is prohibited within any harbor limits of the United States Whenever any licensed officer in charge of any vessel shall authorize or permit such unnecessary whistling, such officer may be proceeded against in accordance with the provisions of R S 4450 (46 U S C 239), as amended, looking to a revocation or suspension of his license

62 23 Draft. The master of every seagoing vessel shall, whenever leaving port, enter the maximum draft of his vessel in the log book

62 24 Hatches. It shall be the duty of the master of any vessel under the jurisdiction of the Coast Guard to assure himself before proceeding to sea that all exposed cargo hatches of his vessel are properly covered

The covers shall be made watertight by the use of pliable gaskets, or by heavy canvas tarpaulins thoroughly covering the hatch covers and firmly secured in place by battens, which shall be securely fastened by toggles or wedges, or by the use of efficient screw fastenings

Hinged doors, portable plates, sidescuttles, gangways, cargo and coaling ports, and all other openings which are required to be kept closed during navigation, shall be closed before the vessel leaves sheltered waters The time of closing and the time of opening shall be entered in the official log book

Failure by the master of any such vessel to observe this section shall be sufficient cause for suspension or revocation of his license on a charge of inattention to his duty

62.25 Lookouts, cabin watchmen, and fire patrolmen. All vessels navigating the ocean during the nighttime shall have a lookout at all times at or near the bow Nothing in this section shall exonerate any master or officer in command from the consequences of any neglect to keep a proper lookout or the neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case

Vessels carrying passengers shall during the nighttime keep a suitable number of watchmen in all passenger quarters and on each deck.

All watchmen shall be under the direct charge of the master or officer in command of the vessel, and each shall report to the officer in command at the pilothouse at fixed intervals of not longer than every hour. Cabin watchmen and cabin patrols on duty in the nighttime shall have in their possession while on such patrol duty a suitable and efficient dry-battery flashlight

The uniform of the night watchman shall be so conspicuous as to be readily distinguished from other persons, and the coat or sweater marked with a rating badge worn on the left sleeve, marked "Watchman," and front of cap marked "Watchman "

Watchmen or patrolmen shall not be required to perform any other duty while on watch

On all passenger vessels having berth or stateroom accommodations for passengers there shall be maintained while passengers are on board an efficient fire patrol so as to cover completely all parts of the vessel accessible to passengers or crew, at 20-minute intervals between the hours of 10 p m and 6 a m , except machinery spaces, occupied passenger or crew sleeping accommodations, and cargo compartments which are inaccessible to passengers or crew while the vessel is being navigated

Failure of a patrolman to follow a prescribed route, or to record each station within a definite time shall be entered on the record, along with the reason for the irregularity

The patrolman shall report to the bridge every hour on vessels where the fire patrol system is not equipped with a recording apparatus in the control stations In vessels requiring more than one patrol route, one patrolman may contact the others and make the joint report to the bridge

A patrolman while on duty shall have no other tasks assigned to him He shall be provided with a flashlight and shall wear a distinctive uniform or badge

In the case of vessels of noninflammable construction which are fitted with an approved automatic fire-detecting and alarm system in public spaces, the patrol throughout the entire patrolled area may be at 1-hour intervals

62 26 Flashing the rays of a searchlight or other blinding light Flashing the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way is prohibited Any person who shall flash or cause to be flashed the rays of a blinding light in violation of the above may be proceeded against in accordance with the provisions of section 4450 R S , as amended, looking to the revocation or suspension of his license or certificate

62 27 Unauthorized lights Any master or pilot of any vessel who shall authorize or permit the carrying of any light, electric or otherwise, not required by law that in any way will interfere with distinguishing the signal lights may be proceeded against in accordance with the provisions of R S 4450, as amended, looking to a revocation or suspension of his license

62 27a Routing instructions; strict compliance with Due to existing mine field dangers, all licensed masters, officers, and certificated seamen on United States vessels shall comply strictly with the routing instructions issued by competent naval authority Failure to comply with such routing instructions shall be deemed misconduct within the meaning of R S 4450, as amended (46 U S C 239) Nothing herein shall be construed as relieving the master of the responsibility for the safety of his vessel

62 28 Sanitation It shall be the duty of the master and chief engineer of any vessel under the jurisdiction of the Coast Guard to see that such vessel and the passengers' and crew's quarters are kept in a sanitary condition Failure on the part of the master (or chief engineer so far as it applies to the engineer's department) of any vessel to observe and carry into effect this section shall be sufficient cause for the suspension of his license on a charge of inattention to his duties

62 59 Examination of boilers and machinery by engineer It shall be the duty of an engineer when he assumes charge of the boilers and machinery of a vessel to examine the same forthwith and thoroughly, and if he finds any part thereof in bad condition, he shall immediately report the facts to the master, owner, or agent, and to the Officer in Charge, Marine Inspection, of the district, who shall thereupon investigate the matter, and if the

former engineer has been wilfully negligent in the performance of his duties, he may be proceeded against under the provisions of R S 4450, as amended, looking to a suspension or revocation of his license

62 60 Reports of accidents, repairs, and unsafe boilers and machinery by engineers Before making repairs to a boiler of a steam vessel the engineer in charge of such steamer shall report, in writing, the nature of such repairs to the Officer in Charge, Marine Inspection, of the district wherein such repairs are to be made

And it shall be the duty of all engineers when an accident occurs to the boilers or machinery in their charge tending to render the further use of such boilers or machinery unsafe until repairs are made, or when, by reason of ordinary wear, such boilers or machinery have become unsafe, to report the same to the Officer in Charge, Marine Inspection, immediately upon the arrival of the vessel at the first port reached subsequent to the accident, or after the discovery of such unsafe condition by said engineer *Provided*, That, during the period when a state of war exists between the United States and any foreign nation, communications in regard to accidents shall be handled with caution, and the above-mentioned reports shall not be made by radio or telegram

PART 63—INSPECTION OF VESSELS

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Section 63 1 Application for inspection of vessels, exemption of vessels while laid up or dismantled The annual inspection of any vessel subject to the provisions of Title 52, Revised Statutes of the United States, shall be made only on written application, presented to the Officer in Charge, Marine Inspection, by the owner, master, or authorized agent of the vessel to be inspected. Such application shall state upon its face that previous application for inspection has not been made to any other inspector.

Vessels while laid up and dismantled and out of commission are exempted from any or all inspections required under Sections 4417, 4418, 4426, and 4427 of the Revised Statutes of the United States (46 U S C 391, 392, 404, 405).

All vessels or other floating equipment used by or in connection with any "civilian nautical school" as defined by section one of the Act of Congress approved June 12, 1940 (54 Stat 346, 46 U S C 1331) shall, whether being navigated or not, be subject to all the laws covering the inspection of passenger vessels in effect on or before June 12, 1940, and the regulations thereunder, including the inspection of hulls, the installation and inspection of machinery and boilers, lifesaving and fire-fighting equipment, construction, and the licensing of officers and manning, as more particularly set forth in full in this subchapter and Subchapters E (Load Lines) and F (Boilers and Appurtenances) of this chapter.

63 1a Inspection of motor vessels of over 300 gross tons All the provisions of Title 52 (R S), Laws Governing Steamboat Inspection, and the General Rules and Regulations thereunder including the inspection of hulls, the installation and inspection of machinery and boilers, lifesaving and fire-fighting equipment, construction, and the licensing of officers and manning of inspected vessels, as more particularly set forth in full in Parts 51-57, 59-65, shall be applicable to seagoing vessels of like type and character of 300 gross tons and over propelled in whole or in part by internal combustion engines, in accordance with the provisions of the Act of Congress approved June 20, 1936 (49 Stat 1544, 46 U S C 367) *Provided*, That the Act of June 20, 1936, shall not apply to such vessels, propelled by internal combustion engines, engaged in fishing, oystering, clamming, crabbing, or any other branch of the fishing or kelp or sponge industry. The term "seagoing vessels" as used in this section shall be construed to mean vessels which, in the usual course of their employment, proceed outside the line dividing the inland waters from the high seas as designated and determined under the provisions of the Act of February 19, 1895 (33 U S C 151).

63.1c International voyage definition An international voyage as applied to United States ships includes voyages between (a) United States ports and ports outside the United States, (b) United States continental ports and ports in the Territory of Alaska, Territory of Puerto Rico, Territory of Hawaii, the Panama Canal Zone or any other separate portion of the United States held under a protectorate or mandate, (c) Atlantic Coast of Gulf of Mexico ports and ports on the Pacific Coast.

63 2 Vessels owned or employed by the United States Steam vessels employed by the Government, unless the titles of the same are actually vested in the United States, are not exempt from inspection

63 2a Vessels acquired or documented under the act of June 6, 1941 (a) Vessels acquired or documented under the act of June 6, 1941, shall be subject to the applicable provisions of title 52 of the Revised Statutes, acts amendatory thereof or supplemental thereto and the rules and regulations thereunder

(b) Unapproved lifesaving, firefighting and other equipment may be continued in service as long as, in the opinion of the Officer in Charge, Marine Inspection, such equipment is in good and serviceable condition All replacements shall be in accordance with Coast Guard requirements

(c) Certificates of inspection shall be issued to such vessels on Form 841 by amending the certifying clause and the addition of the following wording "as applied to vessels documented under the act of June 6, 1941," so that the certifying clause reads as follows

I further certify that the said vessel at the date hereof is, in all things, in conformity with the laws governing the Coast Guard and the rules and regulations of the Commandant as applied to vessels documented under the act of June 6 1941

63.3 Authority of inspectors Inspectors may lawfully inspect any vessel within their respective districts upon proper application

63 4 Inspection of hulls. In the inspection of hulls of vessels, the inspector shall carefully inspect every accessible part of the hull, and carefully examine the wood or metal of which the hull is constructed, to determine the condition of same, making all necessary hammer tests of hulls constructed of iron or steel If the inspector shall not have satisfactory evidence otherwise of the soundness of the hull of a wooden vessel, he shall not give a certificate until the same shall be bored or opened up to his satisfaction

All scupper, sanitary, and other similar discharges which lead through the ship's hull shall be fitted with efficient means for preventing the ingress of water in the event of a fracture of such pipes

The requirements of the above paragraph do not apply to the discharges in the machinery space connected with the main and auxiliary engines, pumps, etc

All scupper, soil, and sanitary pipes shall be adequately protected, casings to be substantial and so fitted to be conveniently removed for the purpose of examination

The outboard shaft or shafts on every ocean or coastwise vessel shall be drawn for examination once at least in every 3 years *Provided, however,* If the circumstances warrant it, the Coast Guard District Commander may extend this time to the next regular drydocking period, not to exceed 4 months *Provided, further,* That when it is shown that a vessel has had a long period of lay-up, the Coast Guard District Commander may grant an extension equal to the time the vessel has been out of commission, but in no case shall the extension exceed 1 year

63 5 Notice to inspector of vessel on dock, alterations Whenever any vessel is placed upon the dock for repairs, it shall be the duty of the master, owner, or agent to report the same to the Officer in Charge, Marine Inspection, of that district, so that a thorough inspection may be made by him to determine what is necessary to make such vessel seaworthy if the condition or age of the vessel, in the judgment of the inspector, renders such examination necessary

No repairs or alterations affecting the safety of the vessel, either in regard to hull or machinery, shall be made without the knowledge of the Officer in Charge, Marine Inspection. Drawings or prints of such alterations shall be furnished, in duplicate, to the Officer in Charge, Marine Inspection, having jurisdiction, one copy of which shall be forwarded to the Commandant Notice of such repairs and changes is necessary, even if such work does not require the vessel to be placed in a drydock, and even if there are no licensed officers attached to the vessel

63 5a Gas-free certificates for repairs or alterations involving hot work On any vessel which has carried inflammable or combustible liquids in bulk, as fuel or cargo, whether in a repair yard or elsewhere, no repairs or alterations involving riveting, welding, burning, or like fire-producing operations shall be made in or on the boundaries of oil bunkers, oil tanks, oil pipe lines and heating coils until an inspection has been made to determine that such operations can be undertaken with safety. Such inspections shall be made and evidenced as follows:

(a) When in a port of the United States, this inspection shall be made by a gas chemist certificated by the American Bureau of Shipping, however, if the services of such certified gas chemist are not reasonably available, the marine inspector of the Coast Guard, upon recommendation of the vessel's owner and his contractor, or their representatives, shall select a person who, in the case of an individual vessel, shall be authorized to make the inspection. If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth that fact in writing and qualified, as may be required, shall be issued by the certified gas chemist or the authorized person before the work is started.

(b) When not in such a port and a gas chemist is not available, this inspection shall be made by the senior officer present, who shall make an entry in the log to that effect.

63 6 Certificates of inspection Certificates of inspection for any period less than 1 year shall not be issued, but nothing herein shall be construed as preventing the revocation or suspension of certificates of inspection in case such process is authorized by law.

63 6a Exhibition of certificate of inspection On vessels of over 25 gross tons, the original certificate of inspection must be framed under glass and posted in a conspicuous place in the vessel where it will be most likely to be observed by passengers and others. On vessels of not over 25 gross tons, the original certificate of inspection must be kept on board to be shown on demand.

63 7 Proceeding to another port for repairs The Officer in Charge, Marine Inspection, may issue a permit to proceed to another port for repairs, if in his judgment it can be done with safety. In the issuance of such permits the Officer in Charge, Marine Inspection, will state upon its face, the conditions upon which it is granted and whether the vessel is to be allowed to carry freight or passengers. A vessel whose certificate of inspection has expired shall not be issued a permit allowing it to carry passengers while en route to another port for repairs.

When, under R. S. 4456 (46 U. S. C. 438), vessels obtain a permit from the Officer in Charge, Marine Inspection, of a district to go from his district to another to make repairs, said Officer in Charge, Marine Inspection, shall notify the Coast Guard District Commander, stating the repairs to be made on said vessels. Coast Guard District Commander shall notify the Coast Guard District Commander of the district where such repairs are to be made, furnishing him a copy of the report of the inspector indicating the repairs ordered on said vessels.

63 8 Furnishing of drawings of new vessels to inspectors; marking of draft on vessel On and after July 1, 1930, the owner or builder of every new vessel of over 100 gross tons, before making application for first inspection of the vessel, shall furnish the Officer in Charge, Marine Inspection, of the district where the vessel is to be inspected, drawings or prints, as follows: Sheer, half breadth and body plans, midship section, inboard profile, arrangement of decks and hatch details, capacities of double bottoms and fuel compartments and such other drawings or prints showing fully the general construction of the vessel (of iron, steel, or

wood), including dimensions, spacing of frames, disposition of hull plates, of outside planking and inside ceiling, details of principal scarfs, construction of transverse and longitudinal bulkheads, and location of same

The drawings or prints and description of the vessel shall be furnished in duplicate to the Officer in Charge, Marine Inspection, making the first inspection, one copy of which shall be forwarded to the Commandant

All vessels 50 gross tons and over, under the jurisdiction of the Coast Guard, shall have the draft of the vessel plainly and legibly marked upon the stem and upon the stern-post or rudderpost or at such other place at the stern of the vessel as may be necessary for easy observance. The draft shall be taken from the bottom of the lowest part of the keel to the surface of the water, the bottom of the mark to indicate the draft in feet

63.9 Electrical installations On all vessels contracted for after June 30, 1928, using electricity for any purpose, the installation shall be in keeping with the best modern practice

Wires shall be armored or run in approved metal conduits. Metal conduit or armored casing shall be required in bunkers, cargo spaces, storerooms, etc., and in all places where the leads are liable to mechanical injury. Joints in wiring shall be avoided as far as possible in the above-named spaces, and where joints are necessary they shall be made in metal boxes, readily accessible and protected in the same manner as the leads

When wires are led through beams, frames, or nonwatertight bulkheads, they shall be carried either in metal conduits, armored casing, or protected by hard rubber, or other equivalent bushings

When wires are carried through watertight decks or bulkheads, they shall be provided with a suitable stuffing box at deck or bulkhead. Where such points are liable to mechanical injury, they shall be protected by suitable boxes or cages

In locating the wiring system as a whole, care shall be taken to provide accessibility for examination and repair. Special care shall be taken to avoid any arrangement which might permit the lodgment of standing water, and when necessary, openings in conduits or drains shall be installed to accomplish this purpose

All fixtures, taps, joints, and splices shall be fitted with metal boxes. Boxes in cargo and machinery spaces, galley, and those exposed to weather shall be watertight

Splices shall be so joined as to be both mechanically and electrically secure without solder. They shall then be soldered and properly insulated and further protected by waterproof tape

Changes or alterations in the electrical installations of vessels now in service shall be in accordance with this rule

Special attention shall be given by the inspectors in the examination of present installation to see that it is of such nature as to preclude any danger of fire, giving particular attention to wiring which is carried through wooden bulkheads, partitions, etc

The type of electrical equipment and the types of electric cables to be used in the various parts of vessels constructed after July 1, 1937, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A I E E Standards No 45, October 1930, as published by The American Institute of Electrical Engineers

The type of electrical equipment and the types of electric cables to be used in the various parts of all vessels constructed after January 1, 1939, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A I E E Standards No 45, December 1938, as published by The American Institute of Electrical Engineers

The type of electrical equipment and the types of electric cables to be used in the various parts of all vessels, the contract for the construction of which is signed after June 1, 1941, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A I E E Standards No 45, July 1940, as published by The American Institute of Electrical Engineers

The electrical installation on all existing vessels shall be maintained in good electrical and mechanical condition at all times. Minor replacements of cable and equipment may be made with the same type that was permitted by the regulations at the time the vessel was constructed. Major alterations or major extensions to the electrical installations on existing vessels shall be made in accordance with the rules of this section for new vessels as of the date the contract is made for such alterations or extensions.

For vessels the contract for the construction of which was signed prior to September 2, 1945, the specification covering electrical installations titled "United States Coast Guard, Merchant Marine Inspection, Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945,¹ is, during the Unlimited National Emergency, applicable as alternative provisions to those contained in the foregoing parts of this section. For vessels the contract for the construction of which is signed on and after September 2, 1945, those parts of the specification covering electrical installations titled "United States Coast Guard Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945, specified in paragraphs 1, 4, and 5 thereof relating to electric cable are, during the Unlimited National Emergency, applicable as alternative provisions to those contained in the foregoing parts of this section.

63 10 Emergency lighting system Provision shall be made on all passenger vessels for an electric or other system of lighting, sufficient for all requirements of safety, in the different parts of the ship. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system, and placed in the upper parts of the ship above the margin line.

The exit from every main compartment occupied by passengers or crew shall be continuously lighted by an emergency lamp. The power for these emergency lamps shall be so arranged that they will be supplied from the independent installations referred to in the preceding paragraph in the event of failure of the main generating plant.

On all passenger vessels contracted for on and after July 1, 1935, or where existing emergency installations operated by internal combustion engines are replaced, the emergency generator shall be driven by a Diesel or semi-Diesel engine, equipped with means for quick starting. Such emergency equipment shall be located in steel or iron compartments or rooms on the deck above the weather deck and isolated from the passenger and crew quarters. Where existing installations of emergency engines and generators are located in wooden compartments or rooms, such compartments or rooms shall be made fire-resistant by lining same with asbestos board having a thickness of not less than one-quarter inch over which iron or steel sheathing shall be fitted.

63 11 Specifications covering types of voice tubes and telephones—(a) Signals (1) Steamers using the bell signals between the pilothouse and engine room shall have a tube, of proper size, so arranged as to return the sound of the bell signals to the pilothouse, and shall also be provided with a speaking tube or other device for the purpose of conversation between pilothouse and engine room.

(2) Voice tubes or telephone equipment installed on new or existing vessels or fitted as replacements on existing vessels to provide communication between the pilothouse and (i) the emergency steering station, (ii) the steering engine room, and (iii) the engine room, shall conform to the following requirements:

(3) On ships equipped with a radio installation, voice tube or telephone communication between the radio room and the navigating bridge shall be provided and shall comply in all respects with the requirements set forth below.

(b) **Voice tubes** (1) Where the length of voice tube required exceeds 125 feet or if for other reasons efficient communication cannot be obtained by a voice tube installation, telephone equipment shall be substituted.

¹ A copy of the specifications is on file in the office of the FEDERAL REGISTER, and copies may be obtained upon request from the Com mandant (MMT), United States Coast Guard Headquarters, Washington 25, D. C., or any Coast Guard District Commander.

(2) Where the length of the voice tube as installed is not over 75 feet, the tube used shall be at least 2 inches in diameter. Installations having a length of over 75 feet shall be at least 2½ inches in diameter.

(3) All voice tubes and voice tube fittings shall be of noncorrodible metal, and flexible tubes or bends shall be used in place of fittings wherever possible. Joints in tubing shall be made with white lead, and tubes shall be supported at least every 8 feet on straight leads and on bends as required.

(4) Voice tubes shall be protected where liable to injury and shall not be run in bunkers, cargo spaces, or through machinery spaces unless unavoidable, and they shall be amply protected by metal or heavy sheathing. They shall be provided at the lower end of all risers and in pockets where water can collect with suitable plugs for draining. Flexible terminal tubes, where used, shall have an entire metal inner surface. Voice tubes should be fitted with elliptical belled mouthpieces with hinged covers, with a whistle indicator on the side of the mouthpiece. All voice tubes shall be provided with designating name plates. Telephone equipment may in all cases be installed in lieu of voice tubes.

(c) **Telephone systems** (1) All telephone transmitters and receivers shall be of sound-powered type designed especially for marine use. The Commandant shall approve and list equipment which, if properly installed, will meet the requirements set forth herein. The type number and model shall be plainly stamped on the equipment.

(2) A call signal shall be provided at each telephone station. This signal may be a bell or other sound device which provides a distinctive signal throughout the space where the telephone is installed. At installations which are protected by watertight boxes, all signals shall be of such character as to comply with the above when the box is closed. Ringers, if located outside the box, must be of watertight construction. Installations on new and existing vessels shall be provided with call signals which are actuated by the operation of a magneto generator at the calling station, except that sound powered replacements of battery operated telephone equipment on existing vessels may be provided with battery operated call signals. In all cases the calling circuit shall allow any one station to call any other station individually.

(3) At each telephone installation a suitable hanger for the handset shall be provided. It shall be constructed in such a way as to hold the handset firmly in place and away from the bulkhead. The handset shall not be dislodged from the hanger by the motion of the ship or by a severe shock near the mounting.

(4) Telephones installed at external locations exposed to the weather or in locations subject to severe moisture conditions shall be housed in a substantial, watertight metal enclosure. The cover shall be hinged at the bottom or side of the box and, when closed, shall be fastened by a simple substantial mechanism which, when operated, exerts sufficient pressure to make the enclosure watertight. The gasket shall be fastened to, and inserted in, the edge of the box or cover. The magneto generator and switches shall be of watertight construction. The generator and all switches shall be installed inside of the enclosure.

(5) At other locations where a watertight box is not required, the telephone equipment shall be of splash-proof construction and shall be so installed as to minimize possibility of damage by external means. In engine rooms a booth or other suitable auxiliary equipment shall be provided if necessary in order that a telephone conversation can be carried on while vessel is being navigated.

(6) The system shall be installed independent from any other systems of communication or of wiring, but may be extended to cover any other locations which are necessary or desirable. Telephone cable shall be of a type suitable for marine use and shall be run as close to the fore and aft center line of the vessel as possible, and protected from external damage. On passenger vessels where telephone cable must, due to the vessel's construction, run closer than one-fifth of the beam to the side, port and starboard cables shall be provided and connected in parallel. It shall be so installed as to minimize ingress of water and dampness.

(7) The talking circuit shall be electrically independent of the calling circuit. A short or open circuit or a ground on either side of the calling circuit shall not affect the talking circuit in any way.

(d) **Telegraph** Nothing in the above shall be construed to prevent the use of the so-called telegraph now in use for conveying signals from the pilothouse to the engine room, but in all cases where the telegraph is used the signal shall be repeated back.

(e) **Cable traveler** On all vessels subject to inspection where the distance is more than 150 feet between deck houses a wire cable shall be stretched between the deck houses at all times when the vessel is loaded and being navigated, this cable to be not less than 5 feet from the deck, and there shall be attached at all times to the cable a traveler with a line of sufficient continuous length to insure its operation, in order that communication between both ends of the vessel may be facilitated at all times. *Provided*, That, in addition to the traveler with the endless whip, as many loose rings with lanyards attached may be placed on the cable as may be deemed necessary by the master in charge of the vessel. Failure to have such cable stretched and traveler attached at all times when the vessel is loaded and being navigated shall be sufficient cause for the suspension of the license of the master or officer in charge. *Provided*, That a fore and aft raised bridge shall be accepted in lieu of the wire cable and traveler.

(f) **Electrical engine order telegraph systems** All electrical engine order telegraph systems on vessels, not also equipped with mechanical telegraphs, shall be provided with an alarm, located on the bridge, to indicate visually and audibly the failure of power to the system.

(g) **Engine-room signals** Signals between engine room and pilothouse, whether they be telegraph, bell, whistle, telephone, or voice tubes, shall be examined and tested at each inspection.

63.12 Whistles Inspected motor vessels shall be provided with an efficient whistle sounded by steam or by some substitute for steam to give the necessary whistle signals.

63.13 Fog bells The efficient fog bell required upon vessels by law (sec 1, 26 Stat 325, as amended, 33 U S C 91) shall be held to mean a bell not less than 8 inches in diameter from outside to outside and constructed of bronze or brass or other material equal thereto in tone and volume of sound, and located where the sound shall be the least obstructed.

63.14 Standard in inspection of hulls, boilers and machinery In the inspection of hulls, boilers, and machinery of vessels, the rules promulgated by the American Bureau of Shipping respecting material and construction of hulls, boilers, and machinery, and the certificate of classification referring thereto, except where otherwise provided for by the rules and regulations in this subchapter, Subchapter E (Load Lines), or Subchapter F (Marine Engineering), shall be accepted as standard by the inspectors.

63.14a Special surveys of unclassified passenger vessels Special surveys, applicable to the age of the vessel and corresponding to class surveys, shall be conducted by inspectors on all unclassified passenger vessels. These surveys shall in no way affect the thoroughness of the annual inspections. A notation shall be made in the lower right-hand corner of the certificate of inspection appropriate for the survey, viz:

Special survey No 1	Four years from date of build	S S No 1	Place, date
Special survey No 2	Four years from the date of special survey No 1	S S No 2	Place, date,
Special survey No 3	Twelve years from the date of build	S S No 3	Place, date
Second special survey No. 1	Four years from the date of special survey No 3	Second S S No 1	Place, date
Second special survey No 2	Four years from the date of second special survey No 1	Second S S No 2	Place, date
Second special survey No 3	Twenty-four years from date of build	Second S S No 3	Place, date
Third special survey No 1	This and succeeding surveys are to correspond with the second special survey No 1, etc		

(a) **Special surveys of hull, equipment, and motive power**—(1) **Special survey No. 1.** This survey is to be carried out at 4 years from the date of build

(i) (a) The vessel is to be placed in drydock or upon a slipway and the keel, stem, stern frame or stern post, and outside planking or plating are to be cleaned and afterward examined, recalked, and recoated where necessary, the rudder is to be examined and lifted when required and the gudgeons rebushed or the braces and pintles refitted as may be necessary

(b) In the case of wooden vessels careful examination is to be made of the entire structure, faulty fastenings, bolts, or treenails backed out or otherwise dealt with to the satisfaction of the inspector. When, in the opinion of the inspector, it is necessary, borings are to be made and should they disclose cause for further examination, listings shall be made where and as required to satisfy the inspector

(ii) The holds, 'tween-decks, peaks, bilges, engine and boiler spaces, and bunkers are to be cleaned out and the surfaces of the framing and plating are to be cleaned and examined and recoated where necessary. All the watertight bulkheads are to be examined, and tested if considered necessary, with a head of water

(iii) The platform plates in the engine and boiler spaces are to be removed when required, and in the holds and bunkers one strake of ceiling at the bilges and one strake of ceiling on each side fore and aft and all portable ceiling hatches are to be lifted. All timbers are to be cleaned free from dirt

(iv) The cement or other composition on the inner surface of the bottom plating is to be carefully examined and tested, to ascertain if it is adhering satisfactorily to the plating

(v) Where a double bottom is fitted, the tanks are to be thoroughly cleaned out and examined internally, sufficient ceiling is to be lifted or all the ceiling is to be lifted, if necessary, for cleaning and coating the top plating, and the tanks are to be tested with water pressure equal to the height of the load draft of the vessel

(vi) Where a double bottom and other tanks are used for fuel oil bunkers, the cleaning out of such tanks need not be insisted upon, provided the inspector is able to determine by an external examination that the general condition of the tanks is satisfactory. Tanks in such cases may be tested with oil to the height of the overflow

(vii) Deep water ballast tanks, peak ballast tanks, and fresh water tanks which form a part of the structure of the vessel are to be cleaned out and examined internally, and are to be tested with a head of water to a height of 8 feet above the crown of the tank, or to the height of the load draft of the vessel, or to the highest point to which liquid may rise under service conditions, whichever is highest

(viii) The decks are to be examined, and wood decks are to be bored where worn and renewed if reduced to three-fourths the Rule thickness, or if found otherwise defective

(ix) The masts, spars, rigging, hawse pipes and outfit are to be examined, and found or placed in good and efficient condition, and the anchors are to be examined and found or placed in good condition and their weight, type, and number noted

(x) The hatch covers and fore and afters, the tarpaulins, the hatchway and ventilator coamings, deckhouses, the engine and boiler casings and all other means of protecting openings in the weather decks are to be examined, and found or placed in good condition

(xi) All parts of the steering arrangements together with the blocks, rods, chains, or other transmission gear are to be examined, and found or placed in good condition

(xii) The windlass, hand pumps, sluice valves, watertight doors, and air and sounding pipes are to be examined, and found or placed in good and efficient condition

(xiii) When spaces are insulated in connection with refrigerating plant, the timbers and hatches are to be lifted and an examination is to be made in way of same

(xiv) The engines and boilers of all vessels will be required to undergo periodical surveys at the same time as the special surveys on the hull.

(2) **Special survey No 2** This survey is to be carried out at 4 years from the date of the special survey No 1. All the requirements of special survey No 1 are to be complied with, in addition to the following requirements

(i) (a) A second strake of ceiling on each side fore and aft and all portable ceiling hatches are to be lifted in the holds and bunkers

(b) In the case of wooden vessels no planking is to be removed except, in the opinion of the inspector absolutely necessary to disclose the true condition of the vessel, or as may be found necessary, to effectively remedy the defects otherwise disclosed

(ii) Double bottom and other tanks used as fuel oil bunkers are to be thoroughly cleaned out, cleared of gas, and examined internally, and the tanks are to be tested with water pressure to the height of the overflow

(iii) The chain cables are to be ranged, the shackle pins driven out, and the cables examined, and if found reduced in sectional area at their most worn part to the extent represented by the following table, they must be renewed

Diameter of cable	Maximum reduction to be allowed
$\frac{1}{8}$ inch and under $1\frac{1}{8}$ inch.....	$\frac{1}{8}$ in
$1\frac{1}{8}$ inch and under $1\frac{3}{8}$ inches.....	$\frac{1}{8}$ in
$1\frac{3}{8}$ inches and under $1\frac{5}{8}$ inches.....	$\frac{1}{8}$ in
$1\frac{5}{8}$ inches and under 2 inches.....	$\frac{1}{8}$ in
2 inches and under $2\frac{1}{8}$ inches.....	$\frac{1}{8}$ in
$2\frac{1}{8}$ inches and under 3 inches.....	$\frac{1}{8}$ in
3 inches and under $3\frac{1}{8}$ inches.....	$\frac{1}{8}$ in

(3) **Special survey No 3** This survey is due 12 years from the date of build and can be carried out at any time prior to the date when it becomes due, but it must be carried out within 13 years from the date of build. All the requirements of special surveys Nos 1 and 2 are to be complied with, in addition to the following requirements

(i) (a) All the close ceilings, wood linings, and casings in the holds and bunkers, ceiling spars and platform plates in the engine and boiler spaces are to be lifted, and all rust throughout the vessel, both inside and outside, is to be removed

(b) In respect to wooden vessels, treenails in the bilges must in all cases be backed out, the center line members must be carefully searched and refastened to the satisfaction of the inspector, and where faulty the refastening bolts must be driven through and clinched over rings

(ii) When the vessel is thus prepared, the outer and inner surfaces of the shell plating and the whole of the framing, floors, brackets, reverse bars, keelsons, girders, tank top plating, engine and boiler seatings, shaft tunnels, thrust and shaft stools, beams, watertight bulkheads, rivets, stringers, and decks are to be examined, and found or placed in good condition

(iii) (a) If it is considered necessary by the inspector, the shell plating, deck plating, and such other parts of the vessel as are liable to excessive corrosion are to be drilled, and where a material reduction of over 25 percent in the original scantlings is found to have taken place, the defective parts are to be removed and replaced with new materials of the original scantlings and quality

(b) In the case of wooden ships, the beam ends, knees, beam end connections and all principal parts to be carefully examined and bored as may be required by the inspector, and where necessary to ascertain the condition of the beam ends the deck plank adjacent to the lockstrakes should be removed

(iv) (a) In cases where the deterioration of the scantlings is widespread, a detailed preliminary report with a sketch if possible is to be made by the inspector and forwarded immediately to Headquarters for its consideration

(b) In the case of wooden vessels, listings are to be cut inside along seam lines, without disturbing fastenings, above and below the bilge strakes, so as to expose the timbers for

one-third the length of the vessel, from each end on both sides, and at such additional and intermediate openings as the inspector may require

(v) (a) When all the rust has been removed, the surfaces of the iron and steel work throughout the vessel are to be recoated, but this should not be done until after examination by the inspector

(b) In the case of wooden vessels, if considered necessary by the inspector, planking may, at his discretion, be removed on both sides of the vessel a length equal to one complete strake on one side, on both sides of the vessel under the counter, and from stem aft toward the foremast such length as the inspector may determine, but not less than eight frames. The inspector will, in his discretion, be careful not to have planking removed that has been removed on previous surveys or when the vessel's condition can be disclosed as, or made satisfactory without, disturbance to the planking

(vi) (a) Where side lights are fitted, the condition of the plating in way of same is to be ascertained, and in way of cabin accommodation the lining may, in the first instance, be removed so that the inspector may judge of the condition of the hull at those parts, and if, upon such examination, he considers it necessary, additional lining must be removed

(b) In the case of wooden ships all mast and bowsprit wedging is to be removed, and the condition of the plating of iron or steel masts, bowsprits, and spars tested by hammering or drilling, as may be found necessary

(vii) When spaces are insulated in connection with refrigerating plant, the timbers and hatches are to be lifted, and enough lining is to be removed from all the spaces to enable the inspector to satisfy himself as to the general condition of the plating and framing in way of the insulation

(4) **Second special survey No 1** This survey is to be carried out at 4 years from the date of the special survey No 3. All the requirements of the special survey No 2 are to be complied with

(5) **Second special survey No 2.** This survey is to be carried out at 4 years from the date of the second special survey No 1. All the requirements of the special survey No 2 are to be complied with

(6) **Second special survey No 3** This survey is due in 24 years from the date of build, but it must be carried out within 25 years from the date of build. All the requirements of special survey No 3 are to be complied with in addition to the following requirement

The actual scantlings of the vessel throughout are to be ascertained by the inspector and reported by him in detail to Headquarters. The bottom plating need not be drilled if the cement on same is adhering satisfactorily. Generally, when a material reduction of 25 percent or more is found the material is to be removed

(7) **Third special survey No. 1** This and succeeding surveys are to correspond with the second special survey No 1 and succeeding surveys, unless otherwise determined by the Commandant

(b) **Propelling plant** (1) At these special surveys and on other occasions when the vessel is in drydock, the sea connections, together with the cocks and valves and strainers in connection with same, shall be examined. All iron and steel fastenings of seacocks and valves to the shell plating should be examined and renewed if necessary at each special survey No 3

(2) The outboard shafts shall be drawn for examination at least once every 3 years

When the after bearing is worn down one-fourth inch with shafts not exceeding 9 inches in diameter; five-sixteenths inch when over 9 and not exceeding 12 inches, and three-eighths inch with shafts over 12 inches in diameter, the bearing shall be rebushed

(3) At each special survey, the cylinders or turbines, pistons, valves, pumps, condensers, thrust bearings, main and tunnel shafting, evaporators, and steam steering gear, and such other parts of the machinery as may be considered necessary shall be examined

The pumping arrangements from the several holds, as well as from the engine and boiler spaces, shall be examined

(4) At each special survey, the boilers and superheaters shall be carefully examined inside and outside, and the inspector shall satisfy himself that the boilers and all their appurtenances are in perfect order in every detail. The safety valves shall be carefully examined and set to the working pressure

(5) Internal-combustion engines. A complete examination shall be made of the main and auxiliary machinery. All cylinders, pistons, valves, valve gears, pumps, connecting rods and bearings, guides, cross heads, the crank, thrust, and line shafting shall be examined. The cylinders, pistons, and valves of the air compressors shall be examined

The various engine piping systems, air vessels, coolers, oil tanks, and the engine auxiliaries shall be cleaned if necessary, and examined as far as practicable

Other parts of the machinery as may be considered necessary by the inspector shall be examined. The spare parts should be checked

The requirements for special periodical surveys of steam engines and boiler installations apply to internal-combustion engine installations as far as applicable

(6) The Commandant may in his discretion exempt a vessel of the "Bay and Sound" class from any or all of the requirements of the special surveys applicable to such vessels when in his judgment such survey would be impracticable and unreasonable. *Provided*, That any request for exemption shall be placed before the Commandant by the Officer in Charge, Marine Inspection, having jurisdiction of the vessel, together with the reasons therefor in detail

63 15 Copies of specifications and/or blueprints Sixty copies of all blueprints and/or specifications of every article approved after July 1, 1927, for use on vessels subject to inspection shall be supplied to the Commandant for the use of inspectors

63 16 Use of approved equipment, (a) No lifeboat, lifeboat-disengaging apparatus, life raft, life preserver, fire extinguisher, fire-extinguishing apparatus, or other equipment required to be approved by Title 52, Revised Statutes, shall be used on any vessel inspected and certificated by the Coast Guard which shall not first be approved by the Commandant

(b) Boilers, pressure vessels, machinery, piping, electrical and other installations, including lifesaving, fire-fighting, and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (sec 501, 56 Stat. 180, 50 App Sup, 635), which do not fully meet the detailed requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended. In each instance prior to final action by the Commandant, the Officer in Charge, Marine Inspection, shall notify Headquarters of the facts in the case, together with recommendations relative to suitability for retention

63 17 Repairs to fire-fighting and lifesaving apparatus No repairs or alterations, except in emergency, shall be made to any lifeboat, lifeboat-disengaging apparatus, life raft, life preserver, fire-extinguishing apparatus, or other appliance subject to inspection, without advance notice to the Officer in Charge, Marine Inspection. Such repairs or alterations shall so far as is practicable be made with materials and tested in the manner specified within this part for new construction. Emergency repairs or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, in the district where the

vessel may call after such repairs are made, nor shall any lifeboat or life raft be reconditioned or used on a steamer other than that for which it was built, without notice to and supervision by the Officer in Charge, Marine Inspection, in the district wherein such reconditioning or repairs are to be made

63 18 Crew accommodations On all vessels of 100 gross tons and over, the contract for the construction of which is signed after January 1, 1941, there shall be provided at least one toilet, one washbasin, and one shower or bathtub, for each eight members, or portion thereof, in the crew to be accommodated. The crew to be accommodated shall include all members who do not occupy rooms to which private facilities are attached

When the engine room crew, exclusive of licensed officers and others separately provided for, exceeds eight, their toilet and washroom equipment shall be separate from the other crew members. When the stewards' department crew, exclusive of those separately provided for, exceeds eight, their toilet and washroom equipment shall be separate from the other crew members. Separate facilities shall also be provided for the female members of the crew

All washbasins, showers, and bathtubs shall be equipped with proper plumbing, including hot and cold running water. Washbasins may be located in the crew sleeping quarters, if properly installed and equipped with proper plumbing. The washrooms and toilet rooms shall be equipped with proper drains

The toilet rooms shall be separate from the washrooms and at least one washbasin shall be fitted in each toilet room. All toilets shall be installed with proper plumbing for flushing. Where more than one toilet is located in a space or compartment, each toilet shall be separated by partitions, which shall be open at the top and bottom for ventilation and cleaning purposes. Toilets shall be provided with seats of the open front type that automatically lift up when not in use. Urinals may be fitted in toilet rooms, if desired, but no reduction in the required number of toilets will be made therefor

When the total number of the crew exceeds 100, consideration may be given to special arrangements and to a reduction in number of facilities required

On all vessels of 100 gross tons and over, the contracts for the construction of which were signed on or prior to January 1, 1941, the toilet and washing facilities shall be in keeping with the age, size and service of the vessel and consistent with the principles underlying the requirements for vessels the contracts for the construction of which were signed after January 1, 1941; when reasonable and practicable a minimum of one toilet, one washbasin, and one shower or bathtub for each ten members, or portion thereof, in the crew to be accommodated, shall be provided. On such vessels separate washing facilities are not required where the engine room crew, exclusive of licensed officers and others separately provided for does not exceed ten

PART 64—DUTIES OF INSPECTORS

See		See	
64 1	Increases in passenger allowance	64 10a	Deep sea sounding apparatus
64 2	Publication of inspectors' reports	64 11	Reports of accidents
64.3	Reports of Coast Guard District Commanders and Officers in Charge, Marine Inspection	64 13	Carrying of excess steam
64 4	Requests for testimony	64 15	Guards and rails
64 5	Inspection of boilers	64 16	Inclining tests
64 6	Inspection of steam pipes	64 17	Inspection of air ports and deadlights
64 7	Entrance of boilers by inspectors	64 18	Inspection of lifeboat-disengaging apparatus
64 8	Location of whistles on floating structures	64 19	Signaling lamp
64 9	Location of steam whistles	64 20	Direction finding apparatus
64 10	Testing of boilers and hose	64 21	Fire prevention inspection
		64 22	Inspection of quarters

Section 64 1 Increases in passenger allowance Increases in the passenger allowance of any vessel, whether specified in regular certificate or by excursion permit, may be allowed only after personal inspection of the vessel by the Officer in Charge, Marine Inspection, or by the Coast Guard District Commander if he grants the increase, who shall be satisfied that the vessel and her equipment justify the additional allowance, and of which inspection a written record shall be made and kept in the files of the office granting the allowance and a copy thereof forwarded to Headquarters

64 2 Publication of inspectors' reports Annual reports shall not be made public until after they have been printed and made public by the Coast Guard. No inspector or clerk shall make public any report without the consent of the Coast Guard District Commander or the Commandant of the Coast Guard

64 3 Reports of Coast Guard District Commanders and Officers in Charge, Marine Inspection (a) It shall be the duty of the Coast Guard District Commander to inform in writing their respective Officers in Charge, Marine Inspection, of their decisions in cases of appeals

(b) A Coast Guard District Commander who grants a license to a vessel engaged in towing to carry persons in addition to its crew, under the act approved February 23, 1901 (31 Stat L 800, 46 U S C 548, 459), shall notify the Officer in Charge, Marine Inspection, in whose jurisdiction the vessel is to operate, who shall keep a record of the same

(c) The Officer in Charge, Marine Inspection, shall notify, through his Coast Guard District Commander, the Officers in Charge, Marine Inspection, of adjoining districts of all revocations or suspensions of licenses, the names of all persons from whom licenses have been withheld, the names of all steam vessels neglecting or refusing to make repairs when ordered, and the names of all vessels that have been refused certificates of inspection with the reasons therefor

64 4 Requests for testimony Whenever any inspector shall find it necessary, in conducting his investigations or in the performance of any of his duties, to obtain testimony from the inspectors of other districts, he shall request the same through the Coast Guard District Commander

64.5 Inspection of boilers. Inspectors, at their annual inspections of steam boilers, may cause to be removed from the surface of such boilers as are covered so much of said covering as may be necessary to enable them to examine parts of the boilers which cannot be properly examined from the inside, and shall examine in a thorough and careful manner, when practicable, either externally or internally, all parts of the shell of every boiler, and the masters, engineers, and owners of every steam vessel shall afford every facility necessary to carry out in the most effective and efficient manner the provisions of this section, and in no case shall an intermediate inspection be deemed any part of the regular annual inspection

64.6 Inspection of steam pipes It shall be the duty of inspectors when inspecting or reinspecting a vessel to carefully examine all steam pipes passing through woodwork, and if in their judgment the same are deemed unsafe they shall have them provided with air space and fitted with metal collars

64.7 Entrance of boilers by inspectors It shall be the duty of the inspector who inspects the boilers of any steamer to actually enter the boiler or boilers where it is possible to do so, and to thoroughly examine the interior of all such boilers to see that the braces are in place and of proper size, and to determine whether the boilers are in good condition, before granting a certificate of inspection, such examination to be made after the hydrostatic pressure has been applied. A record shall be made in the inspector's report of inspection showing whether or not the inspector did actually enter the boiler, and if he did not enter the boiler, he shall give his reasons for not entering it

64.8 Location of whistles on floating structures It shall also be the duty of the inspectors to compel all floating structures, such as steam elevators (propelled by their own motive power), to have their whistles located on the front side of such superstructures having an elevation higher than the pilothouse of the vessels

64.9 Location of steam whistles All steam whistles shall be placed not less than 6 feet above the top of the pilothouse of steam vessels where the height of the smokestack will admit the attachment of same below its top, when not hinged for passing under bridges, except upon steamers navigating the Red River of the North, Yukon and similar rivers, and rivers whose waters flow into the Gulf of Mexico, and steamers of less than 100 gross tons, whose steam whistles shall be placed not less than 2 feet above the tops of their pilot-houses; and all double-end ferry steamers, and steamers similarly constructed, shall have a steam whistle both fore and aft of the smokestack, or one steam whistle on either the starboard or portside of the smokestack, so that the steam, when whistle is blown, can be seen from either end of steamer, and it shall be the duty of inspectors to enforce this section at the annual inspection

64.10 Testing of boilers and hose. (a) It shall be the duty of inspectors to be present when the boiler is being tested by hydrostatic pressure, and the inspectors shall observe and note the indication upon the gage

(b) It shall also be the duty of inspectors to examine all pumps, hose, and other fire apparatus and to see that the hose is subjected to a pressure of 100 pounds to the square inch and that the hose couplings are securely fastened in accordance with the rules in this part

64.10a Deep-sea sounding apparatus. It shall be the duty of the Officer in Charge, Marine Inspection, to require all ocean passenger or freight steam vessels of 500 gross tons and upward, except paddle-wheel steam vessels, to be equipped with an efficient mechanical deep-sea sounding apparatus in addition to the ordinary deep-sea hand lead. The mechanical deep-sea sounding apparatus above required shall be installed, kept in working order, and ready for immediate use

64.11 Reports of accidents Officers in Charge, Marine Inspection, shall report forthwith to their Coast Guard District Commanders in detail all accidents of a serious character—such as collisions, founderings, sinkings, fires—and all other casualties of interest to or affecting the Coast Guard in their respective districts

64.13 Carrying of excess steam. When it is known or comes to the knowledge of the Officer in Charge, Marine Inspection, that any steam vessel is or has been carrying an excess of steam beyond that which is allowed by her certificate of inspection, the Officer in Charge, Marine Inspection, in whose district said steamer is being navigated, in addition to reporting the fact to the United States district attorney for prosecution under R. S. 4437 (46 U. S. C. 413), shall require the owner or owners of said steamer to place on the boiler of said steamer a lockup safety valve that will prevent the carrying of an excess of steam and shall be under the control of said Officer in Charge, Marine Inspection

On the placing of a lockup safety valve upon any boiler, it shall be the duty of the engineer in charge of same to blow or cause the said valve to blow off steam at least once in each watch of 6 hours or less, to determine whether the valve is in working order, and it shall be the duty of the master of such vessel to see that this section is observed, and it shall be the duty of the master and engineer to report to the Officer in Charge, Marine Inspection, any failure of such valve to operate

In case no such report is made and a safety valve is found that has been tampered with or out of order, the engineer in charge of such boiler and the master of such vessel shall be proceeded against in accordance with the provisions of R S 4450, as amended (46 U S C 239), looking to a suspension or revocation of their licenses³

It shall be the duty of the Officer in Charge, Marine Inspection, to send a copy of this section to every steam vessel in his district when said copies are furnished by Headquarters

64 15 Guards and rails (a) It shall be the duty of the inspectors when inspecting or reinspecting a vessel to see that all exposed and dangerous places, such as gears and machinery, are properly protected with covers, guards, or rails, in order that the danger of accidents may be minimized, and on vessels equipped with radio (wireless) the lead-ins shall be efficiently incased or insulated to insure the protection of persons from accidental shock. Such lead-ins shall be located so as not to interfere with the launching of lifeboats and life rafts

(b) Effective for new construction outboard rails on passenger decks shall be in at least three courses, including the top, and shall be at least 42 inches high. Inboard rails on passenger decks and all rails on crew decks shall be in at least two courses, including the top, and shall be at least 36 inches high

64 16 Inclining tests When inspectors have any reason to question the stability of any vessel under their jurisdiction, they shall require the owners of the vessel to make inclining tests on such vessel, under the supervision of the Commandant

Every passenger or ferry vessel of 500 gross tons or over, propelled by machinery, and every passenger or ferry vessel intended to carry 50 or more passengers, in either case when making application for first inspection to carry passengers, shall be subjected to an inclining test conducted under the supervision of the Commandant, and the results of the test shall be approved before the vessel shall be certificated

The owner or builder of every vessel described in the second paragraph of this section shall, as soon as possible, furnish the Officer in Charge, Marine Inspection, of the district where the vessel is to be inspected drawings or blueprints, as follows: Sheer, half-breadth and body plans, midship section, inboard profile, floors, framing, bulkheads, arrangement of decks and quarters, general arrangement and location of boilers and machinery, plan and elevation, plan and elevation sections through holds, tanks, bunkers, double bottoms, and compartments, capacity plan of the bunkers, tanks, holds, double bottoms, and compartments, and the following curves: Displacement, vertical center of buoyancy, transverse metacenter, longitudinal center of buoyancy, longitudinal metacenter, center of gravity of water planes from either perpendicular, moment to alter trim, and tons per inch, except for double-end ferryboats, then the drawing or blueprint of curves will only be required to show the displacement, vertical center of buoyancy, transverse metacenter, and tons per inch. The drawings and blueprints required by this paragraph shall be forwarded, upon receipt of same, by the Officer in Charge, Marine Inspection, to the Commandant

Where vessels are required to carry fixed ballast, in order to increase the metacentric height, such ballast shall not be moved except for examination and repair of vessel, and then only in the presence of an inspector

³ Attention is called to R S 4437 (46 U S C 413), which makes the obstructing of a safety valve a misdemeanor subject to a \$200 fine and imprisonment for not to exceed five years

The Officer in Charge, Marine Inspection, shall place a notation in regard to the inclining data on the upper right-hand corner of the certificate of inspection of every vessel subject to this section, to read as follows Data relating to the stability of this vessel is on file at Coast Guard Headquarters, Washington, D C

It shall also be the duty of the Officer in Charge, Marine Inspection, to furnish the master and owner of every vessel under the jurisdiction of the Coast Guard, and upon which the question of stability has been determined by Headquarters, a copy of the letter from Headquarters, giving the result of the inclining test or investigation of the stability of the vessel The Officer in Charge, Marine Inspection, shall require the master of every such vessel to frame this letter under glass and post it in the pilothouse

64.17 Inspection of airports and deadlights It shall be the duty of the inspectors when inspecting or reinspectng vessels to carefully examine all airports and deadlights in the hull, and to satisfy themselves that the same are safe

64.18 Inspection of lifeboat-disengaging apparatus Excluding the emergency boats, not more than one type of disengaging apparatus shall be fitted in the lifeboats of a vessel Such disengaging apparatus as is at present fitted in lifeboats and which has been passed as satisfactory, shall be accepted until replacement becomes necessary

It shall be the duty of the inspectors when inspecting or reinspectng vessels to carefully examine the lifeboat-disengaging apparatus and the blocks and falls thereof and to satisfy themselves that the same are in good condition, and, further, that they shall indicate in Form 840-A at annual inspection the name and record of all lifeboat-disengaging apparatus found, and, if unable to identify such lifeboat-disengaging apparatus by name, they shall within a reasonable time take the matter up with the Coast Guard District Commander in order that such apparatus may be traced for identification and approval record

64.19 Signaling lamp. Ocean and coastwise ships over 150 gross tons shall be equipped with an efficient signaling lamp This lamp shall be permanently fixed above the bridge and equipped with a Fresnel lens and high-speed bulb, operated by a weatherproof key, fitted with a suitable condenser The lamp shall be so connected that it can be operated from the normal source of ship's current, the emergency source, and other emergency batteries if provided

64.20 Direction-finding apparatus. Ocean passenger vessels over 5,000 gross tons shall be provided with a radio direction-finding apparatus which shall be inspected and approved by Federal Communications Commission and kept at all times in efficient condition

If the direction-finding equipment is not installed on the navigating bridge, efficient communication shall be provided from the apparatus to the bridge in accordance with all the requirements of § 63.11

64.21 Fire-prevention inspection (a) When inspecting oil-burning vessels, either internal-combustion type or steam-driven type, the inspector shall examine the tank tops and bulges in the fireroom and engine room to see that there is no accumulation of oil which might create a fire hazard

(b) The examination of the fire-fighting equipment shall be made by inspectors This applies to fire pumps, hose, chemical fire extinguishers, axes, and steam or gas smothering lines to cargo holds and compartments

(c) The inspectors shall examine the fire-fighting equipment provided for the fireroom and engine room to ascertain if it conforms to the regulations in this subchapter and that it is in good condition for immediate use

(d) At the annual inspection or periodical reinspectngs, the inspectors shall examine the water-sprinkling system, when fitted, to ascertain if it is in good condition and ready for immediate use

64.22 Inspection of quarters It shall be the duty of the inspector to examine passengers' and crews' quarters to see that they are kept in a sanitary condition and to report any deficiencies

PART 65—STEAM YACHTS

Sec		Sec	
65 1	Classes	65 10	Equipment for lifeboats
65 2	Lifeboats and life rafts required on vessels of class (a)	65 11	Drawings specifications name plate
65 3	Lifeboats and life rafts required on vessels of class (b)	65 12	Inspection of lifeboats when built
65 4	Size of lifeboats	65 13	Life preservers
65 5	Air tanks on vessels of class (a)	65 14	Fire apparatus
65 6	Air tanks on vessels of class (b)	65 15	Axes and fire extinguishers
65 7	Carrying capacity of lifeboats	65 16	Life buoys
65 8	Davits or cranes	65 17	Inspection
65 9	Marking of lifeboats		

Section 65 1 Classes Ocean and coastwise steam yachts shall be divided into following classes

- (a) Steam yachts navigating more than 20 nautical miles offshore
- (b) Steam yachts navigating 20 nautical miles or less offshore

65.2 Lifeboats and life rafts required on vessels of class (a). Vessels of class shall be required to have lifeboat and life raft capacity for all persons on board Not less than 75 percent of the total capacity shall be in lifeboats and 25 percent may be in collapsible lifeboats or rafts of an approved type

65.3 Lifeboats and life rafts required on vessels of class (b) Vessels of class shall be required to have lifeboat and life raft capacity to accommodate all persons on board Not less than 75 percent of the total capacity shall be in lifeboats and 25 percent may be approved collapsible lifeboats or life rafts

Vessels of class (b) during the interval between May 15 and October 15 in any 1 year both dates inclusive, shall only be required to be equipped with lifeboats and life rafts to accommodate 70 percent of all persons on board, not less than 50 percent of which shall be lifeboats and 50 percent may be in collapsible lifeboats or life rafts of an approved type

65.4 Size of lifeboats The size of lifeboats in vessels of classes (a) and (b) shall be of not less than 125 cubic feet capacity The Coast Guard District Commander of the district in which the vessel is inspected may, if he deems it proper, modify the requirements as to the size of lifeboats

65 5 Air tanks on vessels of class (a) All lifeboats on vessels of class (a) shall be provided with air tanks The construction and arrangement shall be as required in § 59 15 *Provided*, That when motor lifeboats are subdivided with a suitable number of efficient bulkheads, the air tanks may be dispensed with

65 6 Air tanks on vessels of class (b) Only the metal lifeboats on vessels of class (b) shall be required to be provided with air tanks

65 7 Carrying capacity of lifeboats. The carrying capacity of lifeboats on vessels of classes (a) and (b) shall be computed as provided in § 60 15

65 8 Davits or cranes Lifeboats shall, when practicable, be carried under substantial davits or cranes

65 9 Marking of lifeboats Each lifeboat shall be provided with a suitable name on board, or the name of the vessel shall be marked on the bow or stern of the lifeboat

65 10 Equipment for lifeboats. Only lifeboats of more than 180 cubic feet capacity are required to be equipped as provided in §§ 59 11 or 60 9 of this chapter The equipment may be kept on board the steamer ready for use

65 11 Drawings, specifications, name plate All lifeboats shall be substantially constructed in accordance with drawings or blueprints, and specifications approved by the Commandant

Builders of lifeboats shall affix a plate or other device to each lifeboat, having thereon the builder's name, number of boat, date of construction of boat, cubical contents of boat, and number of persons said boat will carry, as determined by the rules of the Commandant

65 12 Inspection of lifeboats when built Coast Guard District Commanders of districts where lifeboats are built shall detail an inspector to any place where lifeboats are being built, whose duty it shall be to carefully inspect and examine the construction of such lifeboats, and he shall satisfy himself that such lifeboats are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders. When the inspector approves the construction of the boat he shall stamp his initials, together with letters "U S C G," on a blank space on the plate required to be affixed to the boat by the builder. The initials of the inspector shall be satisfactory evidence to all parties interested that the boat has been constructed in accordance with the drawings, or blueprints, and specifications on file

65 13 Life preservers These vessels shall be equipped with an approved life preserver for each person on board

65.14 Fire apparatus Pleasure steamers shall be provided with at least one double-acting steam fire pump

Fire mains shall be led from the pumps to all decks with a sufficient number of outlets arranged so that all parts of the vessel may be reached with water

Suitable hose with nozzles and spanners shall be provided, but it shall not be necessary that the hose be coupled to hydrants, but shall be convenient to the hydrants in case of fire

65 15 Axes and fire extinguishers. Axes and fire extinguishers shall be provided in accordance with the tables in Part 61

65 16 Life buoys. Steam yachts shall be equipped with ring buoys with attached self-igniting water lights as provided for passenger steamers of corresponding length

65 17 Inspection. The inspection of hulls, boilers, and appurtenances thereto shall be strictly in compliance with the United States Revised Statutes and the rules and regulations in this chapter

COAST GUARD DISTRICT COMMANDERS AND MERCHANT MARINE ACTIVITIES

District	Title	City	State	Address
1st	Commander, 1st Coast Guard District	Boston	Massachusetts	1400 Customhouse
	Marine Inspection Officer	do	do	1300 Customhouse
	Officer in Charge, Marine Inspection	do	do	447 Commercial St
	do	Portland	Maine	78 Pearl St
2d	do	Providence	Rhode Island	409 Federal Bldg
	Commander, 2d Coast Guard District	St Louis	Missouri	232 Old Customhouse
	Marine Inspection Officer	do	do	210 Old Customhouse
	Officer in Charge, Marine Inspection	do	do	216 Old Customhouse
	do	Calro	Illinois	425-427 New Post Office Bldg
	do	Dubuque	Iowa	301 Post Office and Courthouse
	do	Cincinnati	Ohio	748 Federal Bldg
	do	Louisville	Kentucky	606 Federal Bldg
	do	Memphis	Tennessee	322 Customhouse
	do	Nashville	do	1018 Stahman Bldg
	do	Pittsburgh	Pennsylvania	1215 Park Bldg
	do	Point Pleasant	West Virginia	Post Office Bldg
3d	Commander, 3d Coast Guard District	New York	New York	42 Broadway
	Marine Inspection Officer	do	do	do
	Officer in Charge, Marine Inspection	do	do	do
	do	New London	Connecticut	302 New Post Office Bldg
	do	New Haven	do	311 Federal Bldg
	do	Albany	New York	313 Federal Bldg
5th	do	Philadelphia	Pennsylvania	801 Customhouse 2d and Chestnut Sts.
	Commander, 5th Coast Guard District	Norfolk	Virginia	Box 540, New Post Office Bldg
	Marine Inspection Officer	do	do	do
	Officer in Charge, Marine Inspection	do	do	204 Customhouse
7th	do	Baltimore	Maryland	209 Chamber of Commerce Bldg
	Commander, 7th Coast Guard District	Miami	Florida	Box 378, Coconut Grove Station
	Marine Inspection Officer	do	do	600 Professional Bldg
	Officer in Charge, Marine Inspection	do	do	601 Professional Bldg
8th	do	Tampa	do	406 Federal Bldg
	do	Charleston	South Carolina	32 Customhouse
	do	Savannah	Georgia	206 Customhouse
	do	Jacksonville	Florida	210 Federal Bldg
	do	San Juan	Puerto Rico	Federal Bldg
	Commander, 8th Coast Guard District	New Orleans	Louisiana	382 1/4 Customhouse
	Marine Inspection Officer	do	do	313 Customhouse
	Officer in Charge, Marine Inspection	do	do	311 Customhouse
9th	do	Mobile	Alabama	565 Courthouse and Customhouse
	do	Port Arthur	Texas	410 Blenstein Bldg
	do	Galveston	do	232 Customhouse
	do	Corpus Christi	do	919 Jones Bldg
	do	Houston	do	310 Appraisers Store Bldg
	Commander, 9th Coast Guard District	Cleveland	Ohio	1700 Keith Bldg
	Marine Inspection Officer	do	do	do
	Officer in Charge, Marine Inspection	do	do	do
11th	do	Buffalo	New York	1600 Keith Bldg
	do	Oswego	do	440 Federal Bldg
	do	Detroit	Michigan	205 Federal Bldg
	do	Duluth	Minnesota	430 Federal Bldg
	do	Toledo	Ohio	511 Federal Bldg
	do	Saint Ignace	Michigan	402 Courthouse and Customhouse
	do	Chicago	Illinois	Municipal Bldg
	do	Ludington	Michigan	Customhouse, 610 Canal St
12th	do	Milwaukee	Wisconsin	National Bank of Ludington
	do	do	do	633 Federal Bldg
	Commander, 11th Coast Guard District	Long Beach	California	707 Times Bldg
	Marine Inspection Officer	do	do	1105 Times Bldg
13th	Officer in Charge, Marine Inspection	do	do	do
	Commander, 12th Coast Guard District	San Francisco	California	941-K U S Appraisers Bldg
	Marine Inspection Officer	do	do	907 U S Appraisers Bldg
14th	Officer in Charge, Marine Inspection	do	do	227 U S Appraisers Bldg
	Commander, 13th Coast Guard District	Seattle	Washington	New World Life Bldg
	Marine Inspection Officer	do	do	do
	Officer in Charge, Marine Inspection	do	do	do
15th	do	Portland	Oregon	1005 Felling Bldg
	do	Ketchikan	Alaska	Federal Bldg
	Commander, 14th Coast Guard District	Honolulu	Territory of Hawaii	210 Federal Bldg
	Marine Inspection Officer	do	do	do
16th	Officer in Charge, Marine Inspection	do	do	P O Box 4010.
	do	do	do	do

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TREASURY DEPARTMENT
UNITED STATES COAST GUARD

GENERAL RULES AND REGULATIONS
FOR
VESSEL INSPECTION

Rivers

(Title 46, C F. R. , Parts 113 to 120, Inclusive)



September 1, 1948

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UNITED STATES COAST GUARD HEADQUARTERS,
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The "General Rules and Regulations for Vessel Inspection, Rivers," are applicable to merchant vessels subject to Title 52 of the Revised Statutes of the United States (sections 4399 to 4500, inclusive), and acts amendatory thereof or supplementary thereto

This publication replaces the "General Rules and Regulations for Vessel Inspection, Rivers," dated May 1947, and includes all amendments published in the Federal Register through September 1, 1948. The rules and regulations covering boilers, pressure vessels, and appurtenances (which include castings, piping, valves, mountings, fittings, etc., and the design, construction, installation, and inspection thereof) are contained in a separate publication entitled "Marine Engineering Regulations and Material Specifications." The rules and regulations relative to the examinations for and the issuing of licenses, certificates, raising of grade, etc., and other matters relative to merchant marine personnel are in a separate publication entitled "Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel." The rules and regulations governing tank vessels and tank barges are contained in a separate publication entitled "Tank Vessel Regulations."

General authority over and responsibility for the administration and enforcement of the laws and regulations governing navigation and inspection of merchant marine vessels in the several Coast Guard Districts are vested in and imposed upon the Coast Guard District Commanders in charge of such districts.

Shipowners, operators, builders, vessels' operating forces, and other persons affected by the navigation and inspection laws and regulations should familiarize themselves with the provisions contained herein. To this end, Coast Guard personnel concerned with the administration and enforcement of these laws and regulations will extend every possible assistance.



J F FARLEY,
Admiral, United States Coast Guard, Commandant

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TITLE 46—SHIPPING

CHAPTER I—COAST GUARD: INSPECTION AND NAVIGATION

Subchapter J—Rivers: General Rules and Regulations

PART 113—BOATS, RAFTS, BULKHEADS, AND LIFESAVING APPLIANCES

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Section 113 01 Definition of terms Certain terms used in the regulations in this subchapter are defined as follows

(a) **Commandant.** This term means Commandant of the Coast Guard

(b) **Coast Guard District Commander** This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspections, enforcement, and administration of Title 52, R S, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(c) **Officer in Charge, Marine Inspection** This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection district for the performance of duties with respect to the inspections, enforcement, and administration of Title 52, R S, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(d) **Marine inspector or inspector.** These terms mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an

Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspections, enforcement, and the administration of Title 52, R S , and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(e) **Headquarters** This term means the Office of the Commandant, Washington, D C

113 1 Classification of steamers, river steamers For the purpose of apportioning lifeboat and life-raft equipment, steam vessels under the jurisdiction of the Coast Guard now in service or under construction shall be classified in accordance with the service in which they are engaged

Under the designation of river steamers shall be included all steamers whose navigation is restricted to rivers exclusively

113 2 Lifeboats and life rafts on vessels not carrying passengers All steamers not carrying passengers, except as otherwise provided, shall have at least one good substantial boat with lines attached, and properly supplied with oars, and kept at all times in good condition and ready for immediate use

All vessels of less than 50 gross tons not carrying passengers shall be required to carry only such boats or rafts as in the judgment of the Officer in Charge, Marine Inspection, or Coast Guard District Commander may be necessary

113 3 Lifeboats and other equipment of ferryboats and towed passenger barges Lifeboats and other equipment required on ferryboats are prescribed in Part 117 and on towed passenger barges in Part 119 of this chapter

113.4 Lifeboats and life rafts or life floats required on steam vessels carrying passengers Steam vessels carrying passengers shall be equipped with lifeboats of sufficient capacity to accommodate at one time at least 10 percent of all persons on board, including passengers and crew Three-fourths of such equipment may be in approved life rafts, approved life floats, or approved collapsible lifeboats

113 5 Working boat Steamers of 50 gross tons and upward carrying passengers shall have one working boat with life lines attached, properly supplied with oars and painter, and kept in good condition at all times and ready for immediate use, in addition to the lifeboats required The cubical capacity of the working boats on steamers navigating the Red River of the North, rivers whose waters flow into the Gulf of Mexico, Yukon River, and other similar rivers, the bars and channels of which are liable to sudden change, shall be included in the cubical capacity of lifeboats required

113 6 Motor-propelled lifeboats on vessels Any vessel under the jurisdiction of the Coast Guard may be allowed to carry one motor-propelled lifeboat as a part of the lifeboat equipment required on such vessel, except that on vessels carrying more than six lifeboats under davits two of such lifeboats may be equipped with motors

Gasoline may be used for such motors when it is carried only in substantial seamless steel, welded steel, or copper tanks securely and firmly fitted in such lifeboats and located where the greatest safety will be secured

All fittings, pipes, and connections shall be of the highest standard and best workmanship and in accordance with the best modern practice Storage of gasoline other than in the lifeboats using it shall not be allowed under any circumstances

In computing the cubic capacity of motor-propelled lifeboats the space required for the engine, boiler, motor, and fuel shall be excluded

113.7 Wooden surfboat or seine boat. Vessels engaged exclusively in the business of seine fishing or wrecking may substitute a wooden surfboat or wooden seine boat for the lifeboat as described by §§ 113 10, 113 11, capacity to be determined by § 113 14 of this part.

113 8 Lifeboats and rafts required on inspected motor vessels All vessels propelled by machinery, other than steam, subject to the inspection laws of the United States shall be

required to have the same lifeboat and life raft equipment as steam vessels of the same class and the Officer in Charge, Marine Inspection, shall so indicate in the certificate of inspection. This section shall not apply to such vessels under 50 tons, when navigating in daylight only, and when equipped with air tanks under deck of sufficient capacity to sustain afloat the vessel when full of water, with her full complement of passengers and crew on board, or when properly subdivided by iron or steel watertight bulkheads of sufficient strength and so arranged and located that the vessel will remain afloat with her complement of passengers and crew on board with any two compartments open to the sea.

113.9 When lifeboats and life rafts not required Vessels navigating waters where the average depth of the channel does not exceed 3 feet shall not be required to be equipped with lifeboats or life rafts.

113.10 Lifeboats. Drawings, specifications, name plate All lifeboats shall be substantially constructed in accordance with drawings, or blueprints, and specifications approved by the Commandant. The approval of a lifeboat shall include the arrangement for stowage of all equipment.

Builders of lifeboats shall furnish the Coast Guard District Commander of the district in which the lifeboats are built drawings, or blueprints, and specifications showing and explaining the construction of same, and showing the tensile strength and ductility of the metal used. The metal used shall have a tensile strength of not less than 40,000 pounds per square inch, and an elongation in a length of 4 inches of at least 20 percent when the thickness of the metal is of, or greater than, No. 16 B. W. G., and 15 percent when the thickness of the metal is less than No. 16 B. W. G.

Builders of lifeboats shall affix a plate of brass or the equivalent to each lifeboat, having thereon the builder's name, number of boat, date of construction of boat, cubical contents of boat, and number of persons said boat will carry, as determined by the rules of the Commandant.

113.11 Inspection of lifeboats when built Coast Guard District Commanders of districts where lifeboats are built shall detail an inspector to any place where lifeboats are being built, whose duty it shall be to carefully inspect and examine the construction of such lifeboats, and he shall satisfy himself that such lifeboats are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders. When the inspector approves the construction of the boat, he shall stamp his initials, together with the letters "U S C G," on a blank space on the plate required to be affixed to the boat by the builder. The initials of the inspector shall be satisfactory evidence to all parties interested that the boat has been constructed in accordance with the drawings, or blueprints, and specifications on file.

113.12 Air tanks of lifeboats All lifeboats constructed after June 30, 1905, shall be provided with air tanks. *Provided, however,* That wooden lifeboats for use on steam pleasure vessels navigating rivers and wooden lifeboats for use on steamers navigating the Red River of the North and rivers whose waters flow into the Gulf of Mexico shall be exempt from the use of air tanks.

After June 20, 1912, the air tanks of all lifeboats shall be entirely independent of the hull or other construction and shall be of suitable noncorrosive material and of a capacity of not less than 1.5 cubic feet for each person allowed in metallic boats and not less than 1 cubic foot for each person allowed in wooden boats. *Provided,* That in all metallic boats constructed and inspected on and after March 1, 1931, there shall be at least 1 cubic foot for each person allowed in addition to sufficient air-tank capacity to float the boat (including its equipment), when filled with water. Such air tanks shall be firmly and securely fastened in the hull, and in such manner as will allow them to be temporarily removed, and in no case shall the tanks be punctured or opened for such fastenings. The tops of

such tanks shall be thoroughly protected by a grating or platform or by the thwarts or seats. Such air tanks of 6 cubic feet or less shall be constructed of material of a thickness not less than No 22 B W G, from 6 cubic feet to and including 15 cubic feet, of a thickness not less than No 20 B W G, and all air tanks of more than 15 cubic feet capacity shall be of a thickness not less than No 18 B W G.

All joints of air tanks shall be properly double riveted and tightly calked or securely hook-jointed and efficiently soldered or properly and securely welded, and such air tanks shall be located in such a manner that will permit the lifeboat to be on as near an even keel as possible when flooded with water.

The cubic contents of air space of air tank shall be stamped on the tank where same can be seen when air tank is placed in boat.

All air tanks shall be fitted with a connection of one-half inch outside diameter for testing purposes.

Before any lifeboat is passed and accepted, the air tanks thereof shall be tested in the presence of an inspector by an air pressure of not more than 1 pound to the square inch. At each subsequent annual inspection, or oftener if in the opinion of the inspectors it is necessary or desirable, the inspectors shall satisfy themselves that the tanks are in good condition, but pressure need not be applied unless the inspectors are in doubt regarding the efficiency of the tanks. This does not take from the inspectors the right and authority to satisfy themselves at any time, either by examination or pressure, as to the condition of the tanks.

113 13 Construction of metallic lifeboats. Metallic lifeboats 20 feet in length and under shall be constructed of metal of not less thickness than No 18 B W G. Metallic lifeboats of over 20 and not over 24 feet in length shall have a thickness of metal of not less than No 16 B W G. Metallic lifeboats over 24 feet in length shall be constructed of metal of not less thickness than No 14 B W G.

Lifeboats may be constructed of steel having a minimum tensile strength of not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches, or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved metals. Where steel is used and the minimum thickness of the metal is less than No 16 B W G, the elongation shall not be less than 15 percent in a gage length of 8 inches.

All seams and joints shall be properly double riveted. The seams and butt laps shall lap at least 1½ inches.

The center of the row of rivets nearest the edge of a sheet shall be about three-eighths of an inch from the edge. Rivets shall be staggered, with not less than 18 rivets to the foot, and shall have countersunk heads. The diameter of shank of rivets shall be not less than No 10 B W G.

Angle-bar steel gunwales may be used for all lifeboats when the cross-sectional area of the same is of at least one-sixth the cross-sectional area of the wooden gunwale as now specified and required, subject to the suspension test required of lifeboat when loaded with its full complement of persons and equipment.

All metallic lifeboats shall be furnished with an automatic plug.

113 14 Carrying capacity of lifeboats. The capacity of all lifeboats not otherwise provided for shall be determined by the following rule: Measure the length and breadth outside of the planking or plating and the depth inside at the place of minimum depth. The depth used in calculation shall not in any case exceed 45 percent of the breadth. The product of these dimensions multiplied by 0.6 resulting in the nearest whole number shall be deemed the capacity in cubic feet.

To determine the number of persons a boat is to carry, for river steamers, divide the result by 8.

Example The carrying capacity of a boat 18 feet in length, 5½ feet in breadth, and 2¼ feet in depth shall be determined as follows

$$\frac{18 \times 5\frac{1}{2} \times 2\frac{1}{4} \times 0.6}{8} = \frac{134}{8} = 16.7 = 16 \text{ persons}$$

Every lifeboat shall have sufficient room, freeboard, and stability to safely carry the number of persons allowed to be carried by the above rule, which fact shall be determined by actual test in the water at the time of the first inspection of the lifeboat, except that where a vessel is carrying lifeboats of different types or capacities, at least one lifeboat of each type or capacity shall be so tested

113.15 Capacity of metal, scow-shaped lifeboats Metal lifeboats when built in accordance with the requirements for construction of metallic lifeboats for river steamers in this part, of scow shape, with the ends at least nine-tenths of the width of the boat at its widest part and sides and ends of even height, to be used on steamers navigating rivers only, shall be measured in accordance with the following rule Measure the length and breadth outside of the plates and the depth inside at the center The product of these dimensions multiplied by 0.9 resulting in the nearest whole number shall be deemed the capacity in cubic feet

113.16 Tests of lifeboats at annual inspection The inspectors shall satisfy themselves that every lifeboat, together with its equipment, of all vessels, is in every respect in good condition and ready for immediate use

Every lifeboat, with its required equipment, of passenger vessels, except ferryboats, shall be lowered to near the water and loaded to its allowed capacity, evenly distributed throughout its length, and then lowered into the water afloat *Provided*, That on vessels navigating the Red River of the North, rivers whose waters flow into the Gulf of Mexico, the Yukon, and other similar rivers the lifeboats need not be subjected to the above test, but the inspectors shall satisfy themselves that the davits and falls are of sufficient strength and length by lowering the boats to the water, after which the boats shall be loaded to allowed capacity In making this test persons or dead weight may be used, if persons are used the weight of each person shall average at least 140 pounds When dead weight is used the weight shall be equivalent to at least 140 pounds for each person allowed *Provided*, further, That all lifeboats on all ferryboats shall be lowered to the water afloat and loaded to their full capacity at each annual inspection

113.19 Inclosed lifeboats. All steamers carrying passengers shall be equipped with at least one lifeboat of approved open standard type Where two lifeboats are required, one of the same may be of an approved inclosed type Where three or more lifeboats are required, two of such lifeboats shall be of approved open standard type, one to be carried on each side under davits In no case shall the lifeboat equipment of any steamer consist of more than 50 percent of approved lifeboats of inclosed type

When the approved inclosed type of lifeboats is carried on steamers other than those carrying passengers, such steamers shall also be equipped with one lifeboat of approved open standard type of not less than 180 cubic feet capacity

113.22 Equipment for lifeboats on vessels on all rivers except western rivers whose waters flow into the Gulf of Mexico and the Yukon River All lifeboats except those provided for in §113 22a of this part shall be equipped as follows

(a) **Boathook.** One boathook of clear-grained wood of suitable length but not less than 8 feet by 1½ inches in diameter

(b) **Bucket** One galvanized iron bucket, of about 2 gallons capacity, with lanyard attached

(c) **Hatchet.** One hatchet attached by a lanyard and readily available for use All hatchets provided for use on merchant vessels on and after December 1, 1944, shall be of an

approved type Hatchets provided prior to December 1, 1944, may be continued in service provided they are in good and serviceable condition

(d) **Lantern** One lantern containing sufficient oil to burn at least 9 hours and ready for immediate use

(e) **Life line** A life line, properly secured the entire length of each side, festooned in bights not longer than 3 feet, with a seine float in each bight The life line shall be of a size and strength not less than 12-thread manila rope, and the seine float in each bight shall hang to within 12 inches of the surface of the water when the boat is light

(f) **Life preservers** Two life preservers Wooden floats may be substituted where permitted by law

(g) **Matches** One box of friction matches in a watertight container and carried in a box secured to the underside of the stern thwart or stowed in the locker

(h) **Oars** A full complement of oars and two spare oars

(i) **Painter** One painter of manila rope not less than 2¼ inches in circumference and of a length not less than 3 times the distance between the boat deck and the light draft

(j) **Plugs.** Each drain hole, fitted with an automatic plug, shall be provided with two caps attached by chains Where an automatic plug is not provided for the drain hole, there shall be two plugs attached by chains

(k) **Rowlocks.** One full complement of rowlocks and two spare rowlocks, each rowlock attached to the boat by a separate chain

(l) **Steering oar or rudder** One steering oar with rowlock or becket, or one rudder with tiller or yoke and yoke lines

(m) **Stowage of equipment.** All loose equipment shall be securely attached to the lifeboat to which it belongs

113 22a Equipment for lifeboats on vessels on western rivers whose waters flow into the Gulf of Mexico and the Yukon River All lifeboats on vessels navigating the Red River of the North, rivers whose waters flow into the Gulf of Mexico, and the Yukon River shall be equipped as follows

(a) **Boathook** One boathook of clear-grained wood of suitable length but not less than 8 feet long by 1½ inches in diameter

(b) **Hatchet.** One hatchet attached by a lanyard and readily available for use All hatchets provided for use on merchant vessels on and after December 1, 1944, shall be of an approved type Hatchets provided prior to December 1, 1944, may be continued in service provided they are in good and serviceable condition

(c) **Lantern** One lantern containing sufficient oil to burn at least 9 hours and ready for immediate use

(d) **Life line** A life line, properly secured to the entire length of each side, festooned in bights not longer than 3 feet, with a seine float in each bight The life line shall be of a size and strength not less than 12-thread manila rope, and the seine float in each bight shall hang to within 12 inches of the surface of the water when the boat is light

(e) **Life preserver** One life preserver A wooden float may be substituted where permitted by law

(f) **Matches.** One box of friction matches in a watertight container and carried in a box secured to the underside of the stern thwart or stowed in the locker ,

(g) **Oars.** Four oars and one spare oar

(h) **Painter.** One painter of manila rope not less than 2¼ inches in circumference and of a length not less than 3 times the distance between the boat deck and the light draft

(i) **Plugs.** Each drain hole, fitted with an automatic plug, shall be provided with two caps attached by chains. Where an automatic plug is not provided for the drain hole, there shall be two plugs attached by chains

(j) **Rowlocks** Four rowlocks and one spare rowlock, each rowlock attached to the boat by a separate chain

(k) **Stowage of equipment** All loose equipment shall be securely attached to the lifeboat to which it belongs

113 23 How lifeboats shall be carried, davits and cranes required. All lifeboats on vessels carrying passengers shall, if practicable, be carried under substantial davits or cranes, but if it is not practicable so to carry all the lifeboats required, the remainder shall be stowed near at hand, so as to be easily and readily launched. Such davits, cranes, and necessary gear shall be such as will enable the lifeboats to be lowered to the water in less than 2 minutes from the time the clearing away of the boats is begun.

Each lifeboat carried under davits shall be provided with two separate davits. When a single crane is properly adapted to lower a lifeboat, it may be allowed to take the place of the two davits. Such davits or cranes, and the blocks and falls thereof, on all passenger vessels except ferryboats, shall be of sufficient strength to carry the boat with its full load.

All steam vessels, other than steam vessels carrying passengers, shall be equipped with davits or other practicable means for launching the lifeboats. Mechanical davits, when installed on steam vessels not carrying passengers, shall be subject to all the tests required by this section.

No type or make of mechanical or gravity davit shall be used unless it has first been approved by the Commandant.

No mechanical davits of a character which require manual or other power to turn the boats out to the position for lowering into the water shall be fitted on any vessel the keel of which is laid after December 31, 1942, if such davits are to handle a lifeboat which, without its complement of persons on board, but having on board all air tanks and other lifeboat equipment, exceeds 5,000 pounds total weight, or 2,500 pounds for a single davit arm. An exemption to this requirement may be granted during the period of the national emergency, proclaimed by the President on May 27, 1941, if evidence is presented to the Commandant to substantiate a claim that compliance with this requirement would materially delay the completion and delivery of the vessel.

Davits of an approved type, which are capable of swinging the boats into the lowering position without the application of any effort or external force other than that necessary to operate the releasing mechanism, allowing the boat to move from the stowed position to the lowering position by the force of gravity, shall be provided to handle all lifeboats the total weight of which, including air tanks and lifeboat equipment, but without the complement of persons on board, exceeds 5,000 pounds.

Where steel castings are used for davit frames or davit arms this material shall be fully annealed and comply with the following requirements:

(In substantial agreement with A. S. T. M. Spec. A-27-42 and A-215-41)

Tensile strength, minimum, per square inch.....	66,000
Yield point, minimum, per square inch.....	33,000
Elongation in 2 inches, minimum, percent.....	22
Reduction of area, minimum, percent.....	33

Chemical composition for castings not intended to be fusion welded

(In substantial agreement with A. S. T. M. Spec. A-27-42)

Manganese, maximum, percent.....	1.00
Phosphorus, maximum, percent.....	.05
Sulphur, maximum, percent.....	.06

Chemical composition of castings intended to be fabricated by fusion welding

(In substantial agreement with A S T M Spec A-215-41)

Carbon, maximum, percent.....	0 30
Manganese, maximum, percent.....	70
Phosphorus, maximum, percent.....	05
Sulphur, maximum, percent.....	06
Silicon, maximum, percent.....	50

For each reduction of 0 01 percent below the maximum specified carbon content, an increase of 0 04 percent manganese above the specified maximum will be permitted up to a maximum of 1 00 percent

Where structural steel is used for the fabrication of davit frames or davit arms the material shall conform to the following requirements

(In substantial agreement with A S T M Spec A-131-39 and A-7-42)

Tensile strength, per square inch.....	60, 000 to 72, 000
Yield point, minimum, per square inch.....	0 5 T S
Elongation in 8 inches, minimum, percent.....	1, 500, 000
	Ten. Str
Elongation in 2 inches, minimum, percent.....	22

Where welding is employed in the construction of davits, the welders shall be qualified by the Coast Guard

All moving parts of davits shall be provided with bushings of nonferrous metal, roller or ball bearings properly lubricated

An inspector shall be present at the foundry where castings are made to witness the tensile and bend tests prescribed. The manufacturer shall furnish an affidavit stating that the required tests for annealing have been made. When the inspector has satisfied himself that such castings comply with the requirements, he shall stamp the davit arm and frame with the letters U S C G, the initials of his name and the letters F T, and date of inspection

Each davit and frame shall be tested for strength and operation at the place of manufacture in the presence of an inspector

All mechanical and gravity davit arms or frames shall be tested at the extreme outboard position by suspending from the eye or end of each davit arm a weight equal to the weight of the fully loaded and equipped boat (including full complement of persons at 165 pounds each) for which the davit is to be approved, plus 10 percent. Under this test, a davit arm or frame shall show no permanent set or undue deflection. While this test is being conducted, the frame and arms, if of cast material, shall be subjected to a test by being hammered to satisfy the inspector that the castings are sound and without flaw

While this test load is suspended, the operating gear of mechanical davits shall be tested by being operated from inboard to the extreme outboard position with the same operating crank or device used in actual practice aboard ship

The manufacturer shall affix to the davit arm and frame a heavy plate giving the name of manufacturer, date of inspection, serial number, capacity load, space for the inspector's initials, and the letters U S C G. After the inspector has satisfied himself that the assembled installation meets the requirements, he shall stamp the manufacturer's plates with his initials. Each set of davits shall be marked with identical serial numbers by the manufacturer

No davit arm or frame comprising mechanical or gravity davits shall be placed on board any vessel until all of the requirements of the rules of this section have been fully complied with. Whenever mechanical or gravity davits or parts of davits, such as davit arms, or frames, are installed on vessels to take the place of davits, davit arms, or frames which have

become damaged or broken, such davits or frames shall have the manufacturer's name plate affixed thereto

113 24 Numbering and marking of lifeboats. (a) The number of each lifeboat shall be plainly marked or painted on each side of the bow in figures 3 inches high, and, where lifeboats are carried on both sides of a vessel, the odd-numbered boats shall be stowed on the starboard side and even-numbered boats on the port side, i. e., lifeboat No. 1 shall be forward on the starboard side, and lifeboat No. 3 next abaft lifeboat No. 1, lifeboat No. 2 shall be forward on the port side and lifeboat No. 4 next abaft lifeboat No. 2, etc. Where lifeboats are nested, the lifeboat under lifeboat No. 1 shall be numbered 1A, the lifeboat under lifeboat No. 2 shall be numbered 2A, etc.

(b) The cubical contents and number of persons allowed to be carried on each lifeboat shall be plainly marked or painted on each side of the bow in letters and numbers 1½ inches high. In addition, the number of persons allowed shall be plainly marked or painted on the top of at least two of the thwarts in letters and numbers 3 inches high. Such letters and numbers shall be dark on a light ground or light on a dark ground.

113 25 Lifeboats and life rafts kept clear for launching. The decks on which lifeboats of any class or life rafts are carried shall be kept clear of freight or any other obstruction that would interfere with the immediate launching of the lifeboats or life rafts.

113 26 Boat-davit falls, receptacles. It shall be the duty of the master or officer in charge of all vessels to see that the boat-davit falls shall at all times be in readiness for immediate use, and protected from ice, and not painted, and such boat-davit falls on all boats not swung out at boat drills shall be cast loose and overhauled, and it shall be unlawful to stow in any lifeboat articles other than those required by law and this part. On all steamers over 1,000 gross tons, covered tubs, boxes, or reels shall be provided in which to stow away the boat-davit falls.

113 27 Care of lifeboats. Lifeboats shall be stripped, cleaned, thoroughly overhauled, and painted at least once in every year.

113 28 Handling of the boats and rafts. All the boats and rafts shall be stowed in such a way that they can be launched in the shortest possible time and that, even under unfavorable conditions of list and trim from the point of view of the handling of the boats and rafts, it may be possible to embark in them as large a number of persons as possible.

The arrangements shall be such that it may be possible to launch on either side of the vessel as large a number of boats and rafts as possible.

Where practicable, lifeboat chocks shall be so fitted that the lifeboats they serve shall not require lifting before launching.

113 29 Life rafts. Drawings, specifications, name plate, and how marked. (a) All life rafts shall be substantially constructed in accordance with drawings, or blueprints, and specifications approved by the Commandant.

(b) Builders of life rafts shall furnish the Coast Guard District Commander of the district in which the life rafts are built drawings, or blueprints, and specifications showing and explaining the construction of same and showing the tensile strength and ductility of the metal used. Life rafts may be constructed of steel having a minimum tensile strength not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches, or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved metals. Where steel is used and a minimum thickness of the metal is less than No. 16 B. W. G., the elongation shall not be less than 15 percent in a gage length of 8 inches.

(c) Builders of life rafts shall affix a plate or other device to each life raft, having thereon the builder's name, the manufacturer for whom approved, number of raft, date of construction of raft, cubical contents of raft, and number of persons said raft will carry, as determined by the rules of the Commandant.

(d) There shall be stenciled in a conspicuous place on each life raft now in use the number of persons said raft can carry, as hereinafter provided

113 30 Inspection of life rafts when built Coast Guard District Commanders of districts where life rafts are built shall detail an inspector to any place where life rafts are being built, whose duty it shall be to carefully inspect and examine the construction of such life rafts, and he shall satisfy himself that such life rafts are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders. When the inspector approves the construction of the raft he shall stamp his initials, together with the letters U S C G, on a blank space on the plate required to be affixed to the raft by the builder. The initials of the inspector shall be satisfactory evidence to all parties interested that the raft has been constructed in accordance with the drawings, or blueprints, and specifications on file. This section shall apply to all life rafts constructed after June 30, 1912

113 31 Construction of rafts of the catamaran type. All metal life-raft cylinders of more than 15 feet in length or of more than 16 inches in diameter shall be constructed of metal not less than No 18 B W G. No life-raft cylinders shall be of less thickness of metal than No 20 B W G.

The retaining bands which secure the cylinders to the frames shall be made in halves, so that the cylinders may be detached without difficulty and without disassembling the body of the raft, for the purpose of inspection, cleaning, and painting, as required by this section.

Wooden guards and gunwales shall be secured to the retaining bands by angle-iron clips or by the jaws of the retaining bands. Iron rods extending across the raft at top and bottom shall pass through the gunwale and its securing clips or jaws at each end of the raft. The ends of the rods shall be properly secured with a screw nut inside and outside of the gunwale.

All such cylinders shall be divided by watertight bulkheads into not less than three compartments of equal lengths. Cylinders over 9 feet in length shall be divided into equal lengths by watertight bulkheads into not less than one compartment for every 3 feet of its length. One of such bulkheads shall be at the extreme end of each cylinder or as near thereto as the flange of cone or bumped ends will permit. Each compartment shall be provided with a suitable air-pump connection of one-half inch outside diameter, fitted with airtight cap.

Only countersunk-headed rivets shall be used in the construction of metallic life rafts.

All seams and joints shall be properly double riveted, or where welding is employed the welders shall be qualified by the Coast Guard.

The above provisions of this section shall take effect only as to life rafts constructed after December 31, 1908.

The circumferential as well as the longitudinal seams of life-raft cylinders shall be riveted and tightly calked, or securely hook-jointed and efficiently soldered, or properly and securely welded on rafts constructed after June 30, 1905. Such longitudinal seams shall be secured by not less than 12 rivets to each foot, circumferential seams by not less than 10 rivets to each foot, and bulkheads by not less than 8 rivets to each foot. Bulkhead flanges may be single riveted. The diameter of shank of rivets shall be not less than No 10 B W G.

The framework connecting the cylinders of metallic life rafts shall be substantially built and capable of resisting the strain which tends to break the cylinders apart when the raft is broadside on in surf or seaway.

Before any life raft is passed and accepted, the air tanks thereof shall be tested in the presence of an inspector by an air pressure of not more than 1 pound to the square inch. At each subsequent annual inspection, or oftener, if in the opinion of the inspectors it is necessary or desirable, the inspectors shall satisfy themselves that the tanks are in good

condition, but pressure need not be applied unless the inspectors are in doubt regarding the efficiency of the tanks. This does not take from the inspectors the right and authority to satisfy themselves at any time, either by examination or pressure, as to the condition of the tanks.

113 31a Care of life rafts All life rafts shall be stripped, cleaned, painted, and thoroughly overhauled at least once in every year, and inspectors shall carefully examine at all inspections the material which supports the platform of all life floats in order to determine to their satisfaction that the strength is maintained. If it is found that deterioration has begun, it shall be corrected, even to the extent of requiring the renewal of the platform-supporting device.

113 41 Carrying capacity of catamaran life rafts The capacity of all catamaran life rafts shall be determined as follows:

For every person carried there shall be not less than 3 cubic feet of air space or equivalent buoyancy and a deck area of not less than $2\frac{1}{2}$ square feet.

113 43 Equipment for life rafts All life rafts shall be equipped as follows:

(a) **Boathook** One boathook of clear-grained wood of suitable length but not less than 6 feet by $1\frac{1}{4}$ inches in diameter.

(b) **Life line** A life line properly secured entirely around the sides and ends of the life raft, festooned in bights not longer than 3 feet, with a seine float in each bight. The life line shall be of a size and strength not less than 12-thread manila rope.

(c) **Oars or paddles** Four oars and one steering oar for all life rafts for seven persons and over. The oars shall be of suitable size but not less than 8 feet in length. Two paddles for all life rafts for six persons or less. The paddles shall be of suitable size but not less than 5 feet in length.

(d) **Painter** One painter of manila rope not less than $2\frac{1}{4}$ inches in circumference and of a length not less than three times the distance between the boat deck and the light draft.

(e) **Rowlocks** On life rafts for seven persons and over, five rowlocks attached by separate chains in such a manner that they may be used from either side of the raft. A becket may be substituted for the steering oar rowlock.

(f) **Stowage of equipment** The boathook and oars or paddles shall be securely lashed on the sides of the life raft to which they belong.

113 43a Equipment for life floats All life floats shall be equipped as follows:

(a) **Boathook** One boathook of clear-grained wood of suitable length but not less than 6 feet long by $1\frac{1}{4}$ inches in diameter.

(b) **Life line** A life line properly secured entirely around the sides and ends of the float, festooned in bights not longer than 3 feet, with a seine float in each bight. The life line shall be of a size and strength not less than a 12-thread manila rope.

(c) **Paddles** Four paddles.

(d) **Painter** One painter of manila rope not less than $2\frac{1}{4}$ inches in circumference, and of a length not less than three times the distance between the boat deck and the light draft.

(e) **Stowage of equipment** The boathook and paddles shall be securely lashed on the sides of the life float to which they belong.

113 44 Life preservers—(a) Number required All vessels shall be provided with one approved life preserver for each person carried.

(b) **Distribution, stowage, and notices** (1) Life preservers, including those especially provided for children, shall be properly distributed throughout the staterooms, berthings, and other places convenient for passengers and crew.

(2) Lockers, boxes, and closets in which life preservers are stowed shall be plainly marked, and the life preservers contained therein shall be readily available.

(3) Life preservers stowed overhead shall be so supported that they can be quickly released and distributed among passengers. Where life preservers are stowed overhead at

a height greater than 7 feet from the deck below, efficient means shall be provided for their immediate release and distribution, to be operated by persons standing on the deck

(4) A printed notice shall be posted in every cabin and stateroom and in conspicuous places about the deck, informing passengers of the location of the life preservers and describing and illustrating the method of applying or adjusting them

(e) (Canceled)

Note—The specifications for buoyant materials have been revised and transferred to Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations. These specifications have not been reprinted herein but may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows

164 001 Cork, Sheet (46 CFR Subpart 164 001)

164 002 Balsa Wood (46 CFR Subpart 164 002)

164 003 Kapok, Processed (46 CFR Subpart 164 003)

(f) **Specifications for standard type block-cork life preserver**—(1) **Type** The type shall conform to Figure 1, and shall be reversible and vestlike, with recesses under arms to

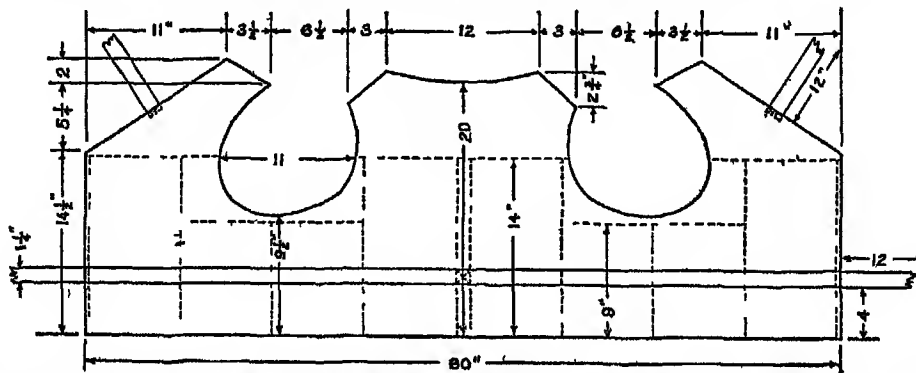


FIGURE 1—Approximate dimensions of a standard type cork and balsa-wood life preserver cutting pattern
Dotted lines indicate stitching

allow front and back sections to fit around the upper part of the wearer and held in place by straps, the whole to be of such construction and character as to support the wearer in an upright or slightly backward position. Children's life preservers are to be of the same general form and construction and conform in every respect, as regards material and design, to the standard approved adult life preserver with the exception that the size is to be reduced one-third.

(2) **Buoyant material.** It shall contain eight blocks of cork of the following approximate dimensions: 4 blocks 11 by 5 by $1\frac{1}{4}$ inches and 4 blocks 6 by 5 by $1\frac{1}{4}$ inches. The corners and edges of the blocks shall be slightly rounded or beveled. The weight of the finished cork in each life preserver shall be not less than 4 pounds and not more than 4 5 pounds.

(3) **Buoyancy test.** The life preserver shall be submerged in a tank of fresh water for a period of 48 hours. The adult life preserver shall then support in fresh water a net weight of $16\frac{1}{2}$ pounds or 11 pounds for children's type.

(4) **Cover.** The cover shall be of unbleached, uncolored drill or twill, without filling or sizing, weighing not less than 7 2 ounces to the square yard. It shall be in not more than two pieces, one piece for either side.

(5) **Marking.** Each life preserver shall be plainly marked on the front compartment with either the word "Adults" or the word "Children" as the case may be. It shall also be plainly stenciled with the name and address of the manufacturer and with the official approval number assigned to the life preserver.

(6) **Smooth surface.** The outside surface, edges, and corners of the buoyant material shall be of such smoothness as will prevent undue destruction of the covering material and present a suitable smooth surface for legible stenciling and stamping by inspectors

(7) **Stitching.** All seams and other machine sewing shall be made with a short lock stitch with not less than eight stitches to the inch. The lower longitudinal edge of the covering seam shall be turned to a roll and closely rope stitched or it may be machine sewn with a short lock stitch with not less than eight stitches to the inch

(8) **Straps.** The straps shall have a tensile strength of at least 175 pounds and shall be of double-woven cotton tape $1\frac{1}{4}$ inches in width having selvage or cord edges. One strap on each side secured by double stitching and extending 12 inches beyond the end of the life preserver, and two neck straps 12 inches in length. All straps are to be sewn to the body of the life preserver by double stitching

(9) **Thread.** The thread shall be of a size and strength not less than Barbour's linen, three-cord, No 25 machine thread. Any thread other than of linen shall require the approval of the Commandant

(g) **Specifications for standard type balsa-wood life preserver—(1) Type.** This shall be the same as for cork as provided in § 113 44 (f) (1)

(2) **Buoyant material.** It shall contain eight blocks of balsa wood of the following approximate dimensions: 4 blocks 11 by 5 by $1\frac{1}{4}$ inches and 4 blocks 6 by 5 by $1\frac{1}{4}$ inches. The corners or edges of the blocks shall be slightly rounded or beveled. The weight of the finished balsa wood used in each life preserver shall be not less than $2\frac{1}{2}$ pounds nor more than 3 pounds

(3) **Buoyancy test.** This shall be the same as provided in § 113 44 (f) (3)

(4) **Cover.** This shall be the same as provided in § 113 44 (f) (4)

(5) **Marking.** This shall be the same as provided in § 113 44 (f) (5)

(6) **Smooth surface.** This shall be the same as provided in § 113 44 (f) (6).

(7) **Stitching.** This shall be the same as provided in § 113 44 (f) (7)

(8) **Straps.** This shall be the same as provided in § 113 44 (f) (8)

(9) **Thread.** This shall be the same as provided in § 113 44 (f) (9)

(h) (Canceled)

NOTE—The specifications for the standard kapok life preservers are contained in a separate pamphlet entitled "Life Preservers, Kapok, Adult and Child," and may be obtained from the Commandant (MMT), U S Coast Guard, Washington 25, D C

(i) **Factory inspection.** An inspector shall examine all life preservers at the place of manufacture. After satisfying himself that they have been manufactured according to the requirements of these rules, he shall select indiscriminately from each lot of 250 at least one life preserver to be tested for buoyancy

Where such life preservers are found to conform to all the requirements of these rules, the inspector shall stamp them with the word "Approved," the initials of his name, the date of examination, and location of his local office

(j) **Shipboard inspections.** At each annual inspection of any vessel, or oftener if deemed necessary, the life preservers shall be examined by an inspector to determine serviceability. When life preservers are found to be in accordance with the requirements, the inspector shall stamp them with the word "Passed," his initials, port, and date. Life preservers found not to be in a serviceable condition shall be removed from the vessel's equipment and, if beyond repair, shall be destroyed in the presence of the inspector

(k) Manufacturer's affidavit**AFFIDAVIT OF MANUFACTURER OF STANDARD TYPE LIFE PRESERVERS**

STATE OF -----

County of -----

On this ----- day of -----, 19-----,

I, the undersigned, -----

-----, hereby certify that I am the ----- of the
(Name) (Title)----- located at -----,
(Name of company)that I am authorized to make this affidavit, and that the standard type -----
(See note 1)

life preservers of our manufacture furnished directly or through agents or dealers for use on vessels subject to the jurisdiction of the United States Coast Guard, comply with the applicable provisions of the regulations prescribed

(Signature) -----

Subscribed and ----- to before me this ----- day of -----
(Sworn or affirmed)

-----, 19-----

(Signature) -----

Notary Public

[SEAL]

NOTE 1 —Indicate adult or child size and name or description of buoyant material.

113 45 Wooden life floats Vessels navigating rivers and carrying passengers shall be allowed to use wooden floats, when made as approved by the Commandant, one for each deck or steerage passenger

When wooden life floats are used in accordance with the above paragraph, they shall be made of light, buoyant wood and shall not exceed 25 pounds in weight. The finished float shall be not less than 4 feet in length, 12 inches in width, and 1½ inches in thickness, and shall be made of one piece, except, if it is not practicable to procure suitable wood of sufficient width, it may be made of not more than two pieces, which shall be securely attached together with wooden dowels. No metal shall be used in the construction of the float. It shall be provided with two handholes, one at each side, midway in the length, which handholes shall be cut through the float and be not less than 6 inches in length and 2 inches in width, with a margin of at least 1 inch at the edge of the float. *Provided*, That wooden life floats made of balsa wood shall be not less than 3 feet in length, 11½ inches in width and 2 inches in thickness. The balsa wood used in the construction of such floats shall be of the same quality as required for balsa wood life preservers. Each two-piece float, in addition to the doweling, shall be securely glued, the dowels to be 4 in number, of ¾-inch diameter, made of straight grained dry hardwood, driven through and entirely across the float through holes bored to a slightly less diameter than the dowel.

At each annual inspection of any vessel, and oftener if deemed necessary, it shall be the duty of the inspectors making the inspection to examine and inspect all wooden life floats in the equipment of such vessel for compliance with the requirements of this section. When found to be in accordance with the requirements, the inspector shall plainly stamp such wooden life floats with a stamp bearing the word "Passed," his initials, the inspector's port, and date

118 46 Life buoys—(a) Number required. (1) The minimum number of approved 30-inch life buoys and the minimum number to which approved water lights shall be attached shall be in accordance with the following table

Length of vessel	Minimum number of approved 30 inch life buoys	Minimum number of approved 30 inch life buoys with approved water lights attached
Under 100 feet	2	0
100 feet and under 200 feet	4	2
200 feet and under 300 feet	6	2
300 feet and under 400 feet	12	4
400 feet and under 600 feet	18	9
600 feet and under 800 feet	24	12
800 feet and over	30	15

(2) One life buoy on each side of a vessel shall have an attached line at least 15 fathoms in length

(b) Distribution and securing of life buoys and water lights All life buoys and water lights shall be distributed and secured as follows

(1) All life buoys shall be so placed as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to the persons concerned

(2) The life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way

NOTE—The specifications for life buoys are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein As these specifications cover the manufacture of ring buoys, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C , and are identified as follows

160 009 Buoys, Life, Ring, Cork, and Balsa Wood (46 CFR Subpart 160 009)

164 001 Cork, Sheet (46 CFR Subpart 164 001)

164 002 Balsa Wood (46 CFR Subpart 164 002)

118 46a Self-igniting water lights—(a) Design. The self-igniting water lights for ring buoys shall consist of a cylinder (with bumped heads or ends) made of good sheet copper of not less than 0 022 inch thick, and shall be so designed as to be nonexplosive, and shall be free from any defects which may affect the serviceability or operation of the light The cylinder shall be sufficiently weighted in the bottom to recover and maintain an upright position in the water, and all circumferential and horizontal seams of the cylinder shall be hook-jointed and soldered, and the top circumferential seam shall be flush, so as to prevent the lodgment of water

(b) **Plug.** The cylinder shall be provided with a plug or other device of such character that when removed from the cylinder sufficient water will be admitted to insure the prompt and efficient action of the light, regardless of whether the cylinder when first striking the water becomes completely submerged

(c) **Operation** The removal of the plug or device shall be effected by the operation of a lanyard attached to the buoy and to the plug or device on the cylinder, and shall be so arranged and constructed that the weight of the buoy when thrown overboard will automatically disengage the plug or device, and will insure that the light will self-ignite within one minute after reaching the surface of the water

(d) **Chemical content** The cylinder shall contain calcium carbide (taken from fresh stock entirely free from the white powdery substance resulting from exposure to the air) and calcium phosphide sufficient to create a brilliant flame of at least 150 candlepower, which shall be maintained and burn for a continuous period of not less than 45 minutes

without emitting obnoxious fumes. If at any time during this period the flame is extinguished, due to the total submersion of the light, the light shall self-ignite upon coming to the surface.

(e) **Marking.** The cylinder shall be plainly marked with the word "Top" at its top, and permanently indented or embossed with the name and address of the manufacturer, the year of manufacture, and the statement that the device meets the requirements of the Commandant. The use of labels of any description for this purpose is forbidden.

(f) **Approval.** No type or make of water light will be approved which has not been tested by the National Bureau of Standards, Department of Commerce, and found to conform in all respects to these requirements.

113 47 Steering apparatus. (a) Extra steering apparatus consisting of relieving tackle, or of auxiliary power or hand steering gear attached to the rudder stock independent of the regular steering gear shall be provided.

(b) Where reasonable and practicable, the emergency steering wheel shall be located on the after weather deck, and an efficient means of communication shall be provided between the pilothouse, the emergency steering station, and the steering engine room.

(c) The following requirements relative to the arrangement of steering stations are applicable to new installations and replacements of existing installations on all classes of vessels.

(1) Steering wheels in or at steering stations shall be installed in a vertical position and arranged for steering by the helmsman when standing abaft the wheel and facing forward. The top of the steering wheel, the rudder blades, and the head of the ship shall move in the same direction.

(2) When a "trick" wheel is installed in the steering gear room and is used for warming up and testing the gear, and also for steering purposes, this wheel shall be arranged as follows:

(i) If the "trick" wheel is installed in a vertical position it shall meet all requirements outlined in subparagraph 1.

(ii) If the "trick" wheel is installed in a horizontal position it shall turn in a clockwise direction for "right rudder" and in a counterclockwise direction for "left rudder." With this arrangement, the helmsman need not stand abaft the wheel.

(3) Where "trick" wheel or other device is installed in the steering gear room for the sole purpose of warming up and testing the gear, it may be installed to best suit design and operating conditions of the gear. A plate shall be fitted on this wheel or device with indicating arrows showing the direction of movement to produce "right rudder" and "left rudder."

(4) When auxiliary steering gear is installed in lieu of relieving tackles, the steering wheel or device used for operating the gear shall meet all requirements outlined in paragraph (c) (1) of this section.

(5) At all steering stations, there shall be installed a suitable notice on the wheel or device, or in such other position as to be directly in the helmsman's line of vision, to indicate the direction in which the wheel or device must be turned for "right rudder" and for "left rudder."

(d) Where no regular rudder is fitted and steering action is obtained by a change of setting of the propeller unit, the requirements of paragraphs (a), (b) and (c) of this section will not generally be applicable, and special consideration will be given.

113 47a Embarkation aids—(a) Ladders. Vessels carrying passengers shall be provided with suitable ladders to enable passengers to descend conveniently to the lifeboats and life rafts.

(b) **Illumination for boat-launching operations.** (1) Provision shall be made on all passenger vessels, where the boat deck is more than 30 feet above the water line at the lightest seagoing draft, for readily and continuously available illumination from the vessel of lifeboats

when alongside and in process of or immediately after being launched There shall be a self-contained source capable of supplying, when necessary, this safety lighting system and placed in the upper part of the vessel above the bulkhead deck

(2) The emergency generating set will ordinarily provide a satisfactory source of illumination, and, where used for this purpose, it shall be of sufficient power to provide for such illumination in addition to other demands made upon the set

113.48 Means of escape from steamers On all steamers where the plans and arrangements will possibly permit, all inclosures where passengers or crews may be quartered, or where anyone may be employed, shall be provided with not less than two avenues of escape, so located that if one of such avenues is not available another may be

Every steam vessel shall be provided with sufficient means of escape from the lower to the upper deck, or vice versa, and every steamer of 50 tons or over carrying passengers shall be provided with permanent stairways forward and aft, except where said stairways on towing boats would interfere with towing bits

Airports 16 inches or more in diameter in the hull of all passenger vessels that open into the passageways shall have a life line securely fastened overhead within the passageway This life line shall be not less than 2 inches in circumference, knotted every 3 feet and of sufficient length to reach the water at the lightest seagoing draft

113.50 Transverse watertight bulkheads Every new mechanically propelled vessel of more than 75 gross tons carrying passengers for hire shall have a sufficient number of transverse watertight bulkheads so that the vessel will remain afloat and have positive stability in the event any one main compartment is flooded

A forepeak or collision bulkhead shall be fitted and located not less than 5 percent of the length of the ship, and not more than 10 feet plus 5 percent of the length of the ship from the bow at the load water line

In vessels where the propelling machinery is below the main deck one bulkhead shall be fitted at the forward end of the machinery space (which includes boiler space) and one bulkhead shall be fitted at the aft end of the machinery space Other transverse bulkheads shall be so located as to meet the above requirements of subdivision and stability

Main transverse bulkheads shall not be stepped, but may be recessed No recess shall be fitted nearer the vessel's side than one-fifth of the vessel's beam amidships measured at right angles to the center line at the level of the water line on which the subdivision is based

Bulkheads shall extend to a deck whose distance above the load water line is sufficient to enable the subdivision and stability requirements to be met with a fair margin of safety

If the distance between two adjacent main transverse watertight bulkheads is less than 10 feet plus 2 percent of the vessel's length, measured between perpendiculars at the extremities of the vessel's load water line, only one of these bulkheads shall be regarded as forming a boundary of a main compartment

Existing vessels shall comply with this section unless it can be shown by the owners that their application is impracticable and unreasonable (Effective as to new vessels immediately, as to existing vessels April 15, 1939)

PART 114—FIRE APPARATUS, FIRE PREVENTION

Sec.		Sec.	
114 01	Basis and purpose of regulations	114 15	Portable fire extinguishers
114 1	Fire axes for passenger steam vessels	114 15a	Water-sprinkling systems
114 2	Fire axes for freight and towing steam vessels	114 16	Fire-detecting, alarm, automatic sprinkler, and patrol systems, new and existing vessels
114 3	Location of axes	114 17	Fire-detecting and automatic sprinkling systems
114 4	Glass lamps	114 18	Oxygen-breathing apparatus, gas masks, and flame-safety lamps
114 5	Fire door fenders	114 21	Lubricating oils
114 6	Steam and inert-gas fire-extinguishing systems	114 22	Fire extinguishers for emergency power plants
114 7	Steam fire pumps or their equivalent	114 22a	Fire-resisting bulkheads
114 8	Dimensions of fire pumps, spanners	114 23	Construction of motion picture booths
114 9	Capacity of pipes and hose	114 24	Regulations to guard against and extinguish fire reestablished
114 10	Rotary pumps	114 25	Liquefied petroleum gases for cooking and heating
114 11	Boiler-testing pumps		
114 12	"Doctor "		
114 13	Connecting, bilge, and sounding pipes, hose tests		
114 14	Fire mains and hose connections		
114 14a	Pumps on motor vessels		
114 14b	Fire-fighting equipment on vessels using oil as fuel		

CROSS REFERENCE

Definition of terms See § 113 01

Section 114 01 Basis and purpose of regulations By virtue of the authority vested in the Commandant of the Coast Guard under section 101 of the Reorganization Plan No 3 of 1946 (11 F R 7875), R S 4405, 4426, 4470, 4471, 4477, and 4479, as amended, Act of June 20, 1936, section 2 of Act of October 9, 1940, and section 5 (e) of Act of June 6, 1941 (46 U S C 367, 375, 404, 463, 463a, 464, 471, 472, 50 U S C 1275), the regulations in this part are prescribed to provide adequate means for detecting, preventing, or fighting of fires on board vessels subject to these regulations in accordance with the intent of the various statutes on fire apparatus or fire prevention and to obtain their correct and uniform administration

114.1 Fire axes for passenger steam vessels All steamers navigating rivers only, carrying passengers, are required to be provided with axes, as follows

Gross tons	Axes
All steamers not over 10 tons.....	1
All steamers over 10 tons and not over 25 tons.....	1
All steamers over 25 tons and not over 50 tons.....	2
All steamers over 50 tons and not over 100 tons.....	2
All steamers over 100 tons and not over 200 tons.....	4
All steamers over 200 tons and not over 500 tons.....	6
All steamers over 500 tons and not over 1,000 tons.....	8
All steamers over 1,000 tons.....	10

114 2 Fire axes for freight and towing steam vessels For freight and towing steamers navigating rivers only

Gross tons	Axes
All steamers not over 10 tons.....	1
All steamers over 10 tons and not over 25 tons.....	1
All steamers over 25 tons and not over 50 tons.....	2
All steamers over 50 tons and not over 100 tons.....	2
All steamers over 100 tons and not over 200 tons.....	2
All steamers over 200 tons and not over 500 tons.....	3
All steamers over 500 tons and not over 1,000 tons.....	4
All steamers over 1,000 tons.....	5

1143 Location of axes. All axes shall be located so as to be readily found in time of need, shall not be used for general purposes, and shall be kept in good condition

1144 Glass lamps. The use of glass lamps shall be prohibited on any vessel under the jurisdiction of the Coast Guard unless the same are securely fitted into suitable metal brackets

1145 Fire door fenders All steamers on western rivers having their boilers situated so that the sparks from the fires may be driven back among combustible materials shall have a sheet-iron fender extending forward from the fire doors not less than 2 feet, at the height of the furnace fronts, and connecting with the same

1146 Steam and inert-gas fire-extinguishing systems—(a) General requirements

(1) All mechanically propelled vessels carrying combustible cargo in the holds, 'tween-decks, or other closed cargo compartments, except those engaged exclusively in the carriage of coal in bulk, shall be equipped with means for extinguishing fire in such compartments by the use of a steam fire-extinguishing system or by the use of any inert-gas fire-extinguishing system approved by the Commandant

(2) Cabinets, boxes, or casings inclosing manifolds or valves shall be distinctly marked in painted letters, about 3 inches in height, "Steam Fire Apparatus" or "CO₂ Fire Apparatus," as the case may be

(3) Steam or gas piping fitted for extinguishing fire shall not be used for any other purpose except that it may be used for fire-detecting purposes

(4) Pipes for conveying steam from the boilers for the purpose of extinguishing fire shall not be led into the cabins, other passengers' or crew's quarters, or working spaces. Pipes for conveying carbon dioxide or other extinguishing vapors for the purpose of extinguishing fire shall not be led into the cabins or other passengers' or crew's quarters

(5) Steam smothering lines shall be tested with at least 50 pounds air pressure with ends of the smothering lines capped, or by blowing steam through the lines, and a survey made for detecting corrosion and defects, using the hammer test or such other means as may be necessary

(6) At annual inspections, all carbon dioxide (CO₂) cylinders, whether fixed or portable, shall be examined externally and replaced if excessive corrosion is found, and all cylinders shall also be checked by weighing to determine contents and if found to be more than 10 percent under required contents of carbon dioxide, the same shall be recharged

(b) Steam systems on mechanically propelled vessels contracted for prior to July 1, 1935 (1) The main pipes and their branches, on mechanically propelled vessels carrying passengers or freight, to convey steam from the boilers to the hold and separate compartments of the same shall be not less than 1½ inches in diameter, except on steam vessels employed on western rivers, constructed prior to June 30, 1905, which steam vessels may use branch pipes not less than three-fourths of an inch in diameter. Steam pipes of not less than three-fourths of an inch in diameter shall be led to all lamp lockers, oil rooms, and like compartments, which lamp lockers, oil rooms, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal

(2) All branch pipes leading into the several compartments of the hold of the vessel shall be supplied with valves, the handles distinctly marked to indicate the compartment or parts of the vessel to which they lead. These valves or their handles shall be placed in not more than two places on the most suitable and accessible deck of the vessel and so arranged that all can be inclosed in cabinets, boxes, or casings

(c) Steam systems on mechanically propelled vessels contracted for on or after July 1, 1935. (1) Steam for fire-extinguishing systems shall be available from the main boilers or from a donkey or auxiliary boiler having a minimum capacity equivalent to one square foot of heating surface for each 300 cubic feet of the largest compartment in which cargo is carried. This requirement shall be based upon a rate of evaporation of six pounds of steam

per hour per square foot of heating surface from and at 212° F medium steaming Equivalent values of heating surface will be permitted for boilers having rates of evaporation differing from that herein specified

(2) The minimum boiler capacity shall be based upon the volume of the largest compartment in cubic feet, which shall be determined by measurements taken between fire-retarding boundaries such as decks having hatch covers with proper battening down arrangements, shells, tank tops, watertight and fire-retarding bulkheads.

(3) A steam pressure of at least 100 pounds per square inch shall be maintained for fire-extinguishing purposes Where the maximum allowable boiler working pressure will not permit of this, the maximum steam pressure permitted by the operating boiler pressure limitations shall be provided for this purpose

(4) The pipe lines shall be led from not more than three stations in easily accessible locations on the weather deck to each cargo hold, cargo 'tween-decks, or other closed cargo compartments, and to each cargo-oil deep tank, lamp locker, oil room, and like compartments, which lamp locker, oil room, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal The steam connections to the lamp lockers, oil rooms, and like compartments may be taken from the nearest steam supply line, independent of the extinguishing manifolds In lamp lockers, oil rooms, and like compartments, adequate means may be provided for ventilation if suitable dampers capable of being operated from outside the spaces are fitted in each vent duct

(5) Each pipe in the extinguishing manifolds shall be fitted with a shut-off valve plainly and permanently marked to indicate into which compartment it discharges This requirement also applies to independent extinguishing lines

(6) Manifold steam supply pipes shall be fitted with master valves at the manifolds, and provision shall be made for draining the manifold and individual lines to protect them against freezing If the manifolds are located on an open deck, they shall be inclosed in a metal box

(7) The minimum diameter of any steam fire-extinguishing pipe to a cargo hold, cargo 'tween-decks, other closed cargo compartments, or cargo-oil deep tank shall be 1 inch, the size and number of pipes to be governed by the size of the compartment The minimum diameter of any steam fire-extinguishing pipe to a lamp locker, oil room, or like compartments, shall be three-fourths of an inch

(8) The required diameter of pipe to cargo compartments may be determined by the formula

$$D = \sqrt{\frac{C}{30,000}}$$

where

D = required diameter of pipe, in inches.

C = volume of compartment, in cubic feet

or by the following table

Volume of compartment	Number of branches to compartment	Size of branches	Volume of compartment	Number of branches to compartment	Size of branches
30,000-----	1	<i>Inches</i> 1	94,000-----	2	<i>Inches</i> 1½
48,000-----	1	1¼	135,000-----	2	1½
67,000-----	1	1½	208,000-----	3	1½

(9) The diameter of the main supply line to the manifolds shall be computed by the following formula

$$D = \sqrt{\frac{C}{60,000}}$$

where

D = diameter of pipe required, in inches.

C = volume of all compartments, in cubic feet

(d) **Inert-gas systems, on mechanically propelled vessels** (1) When a carbon dioxide (CO_2) smothering system is fitted in the cargo hold, cargo 'tween-decks, or other closed cargo compartments, or cargo-oil deep tanks, the quantity of carbon dioxide shall be sufficient to give a gas saturation of 30 percent of the gross volume of the largest cargo hold. The quantity in pounds of carbon dioxide required may be determined approximately by the following formula

$$W = \frac{L \times B \times D}{30}$$

where

W = the weight of CO_2 required, in pounds

L = the length of the hold, in feet

B = the mean breadth of the hold, in feet

D = the depth from tank top or flat forming lower boundary to top of uppermost space in which freight may be carried, in feet

(2) When a carbon dioxide (CO_2) smothering system is fitted in the lamp locker, oil room, or like compartments, the quantity in pounds of carbon dioxide required may be determined by dividing the gross volume of the space by a factor of 22. Lamp lockers, oil rooms, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal. The whole charge of gas shall be capable of being released simultaneously by operating one valve and control, and all cylinders shall be completely discharged in not more than 2 minutes.

(3) Pipes used for supplying carbon dioxide to the cargo holds, cargo 'tween-decks, other closed cargo compartments, and cargo-oil deep tanks shall be not less than three-fourths inch inside diameter. Pipes used for supplying carbon dioxide to lamp lockers, oil rooms, and like compartments shall be not less than one-half inch inside diameter.

(4) The control(s) releasing the inert gas shall be located in a position(s) outside the space(s) protected and shall be readily accessible when the vessel is being navigated. All valves shall be permanently marked to indicate into which compartment they discharge.

(5) Provision shall be made to prevent the admission of air into the lower parts of cargo holds, cargo 'tween-decks, and other closed cargo compartments while the inert-gas system is in operation.

(6) Cylinders, piping, and controls for the inert-gas system shall be protected from damage and shall be securely fastened and supported.

1147 Steam fire pumps or their equivalent—(a) Fire pumps on steam vessels contracted for prior to July 1, 1935. (1) Steam vessels required to be provided with double-acting steam fire pumps or other equivalents for throwing water shall be equipped with such pumps according to their tonnage, as follows: Steam vessels over 20 gross tons and not exceeding 150 gross tons shall have not less than 50 cubic inches pump-cylinder capacity. Steam vessels of over 150 gross tons and under 3,000 gross tons shall have not less than one-third of 1 cubic inch pump-cylinder capacity for every gross ton. Steam vessels of 3,000 gross tons and over shall have pump-cylinder capacity of not less than 1,000 cubic inches. This rule shall apply only to pumps installed after June 30, 1907, and all pumps now approved

and in use or installed before said date shall be accepted if complying with requirements of law and regulations in force at the time of their installation

(2) On steam vessels required by paragraph (a) (1) above to have steam fire pumps or their equivalents, the fire mains shall be led from the pumps to all decks, with sufficient number of outlets arranged so that any part of the steam vessel can be reached with water with the full capacity of the pumps and by means of a single 50-foot length of hose from at least one of said outlets. On all classes of steam vessels every such pump shall be fitted with a gage and a relief valve of such size as to restrict the pressure of water to 100 pounds per square inch

(b) Fire pumps on steam vessels contracted for on or after July 1, 1935. (1) Passenger vessels of 100 gross tons and under shall be equipped with one hand fire pump with a pump-cylinder capacity not less than 100 cubic inches, or a power-driven pump of equivalent discharge capacity

(2) Vessels exceeding 100 gross tons shall be equipped with fire pumps and fire piping as follows

(i) All vessels shall be provided with powerful pumps available for use as fire pumps. Passenger vessels of less than 4,000 gross tons shall have 2, and larger passenger vessels at least 3 independently driven pumps connected to the fire main. Cargo vessels and towing vessels of less than 1,000 gross tons shall have 1, and larger cargo or towing vessels at least 2 such pumps so arranged. Each pump shall be capable of delivering two powerful jets of water simultaneously from the highest outlets on the fire main at a Pitot tube pressure of approximately 50 pounds per square inch through nozzles, each having an orifice of not less than $\frac{3}{8}$ -inch diameter where the internal diameter of the hose exceeds $1\frac{1}{2}$ inches and not less than $\frac{1}{2}$ inch in diameter where the internal diameter of the hose does not exceed $1\frac{1}{2}$ inches

(ii) On oil-burning passenger vessels, where two or more pumps are required, they shall not all be located in the same compartment. Where the engine and fire rooms are not entirely separated by steel bulkheads, or if fuel oil can drain from the fire room bilges into the engine room, one of the fire pumps shall be located in an accessible space in a separate compartment

(iii) On oil-burning cargo vessels, where two pumps are required, they may be located in the same compartment provided the compartment is equipped with an approved fixed carbon dioxide extinguishing system

(3) Outlets from the fire mains shall be of a sufficient number and so arranged that any part of the living quarters, weather decks and any part of the cargo decks accessible to crew or passengers, while the vessel is being navigated, may be reached with a single 50-foot length of hose. Outlets within accommodations and service spaces adjacent thereto shall comply with the above or they may be so arranged that any part may be reached with a single 75-foot length of hose provided a siamese connection is fitted at each outlet. Where the fire main is located on an exposed deck, branches shall be provided so that the hose connections necessary to comply with the foregoing be distributed on both sides of the vessel. The fire hose shall be connected to the outlet at all times, except on open decks where the location of the fire hydrants is such that no protection is afforded for the hose in heavy weather. The fire hose may be temporarily removed from the hydrant when it will interfere with the handling of the cargo

(4) Outlet openings shall have a diameter of not less than $1\frac{1}{4}$ " and shall be fitted with suitable hose connections and spanners. The arrangement of the fire hydrant shall be limited to any position from the horizontal to the vertical pointing downward, so that the hose will lead downward or horizontally, in order to minimize the possibility of kinking. In no case will a hydrant arranged in a vertical position with the outlet pointing upward be accepted.

(5) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 pounds higher than the pressure necessary to maintain the requirements of paragraph (b) (2) (1), above, and a pressure gage to indicate the pressure on the fire main. If the fire pumps operating under shut-off conditions are not capable of producing a pressure exceeding 125 pounds per square inch, the relief valve may be omitted.

(6) Fire hose shall not be used for any other purpose than fire extinguishing.

114.8 Dimensions of fire pumps; spanners. Steamers are not restricted to any particular proportions for fire pumps. Any dimensions that will attain the requirements specified in § 114 7, or greater in capacity, may be allowed. *Provided, however,* That all hydrant connections be supplied with suitable spanners.

114.9 Capacity of pipes and hose. The capacity of the pipes and hose leading from the pumps shall in no case be less than that of the discharge opening of the pump. *Provided, however,* That the pipe and hose shall in no instance be less than 1½ inches in internal diameter.

And provided further, That steamers of 15 tons and under may be allowed to use hose of three-fourths of an inch internal diameter, but in no case shall it be less than the discharge opening of the pumps.

114.10 Rotary pumps. A rotary pump, when driven by an engine independent of the main engine, may be considered as an equivalent for the double-acting fire pump and used as such when equal to it in efficiency and capacity.

114.11 Boiler-testing pumps. Any steamer having on board an independent steam pump and an auxiliary boiler suitably arranged and of sufficient strength and capacity for testing the boilers thereof, or if one of the hand fire pumps be suitably arranged and of sufficient strength and capacity for testing the boilers, or if the "doctor," so called, when arranged permanently for testing the boilers, is, in the judgment of the inspectors, suitable for the purposes intended, may be considered as having complied with the law requiring a pump for testing boilers.

114.12 "Doctor." Any steamer of 50 gross tons or under, required to have a double-acting steam fire pump, and having in use on board a "doctor," so called, may be considered as having a lawful equivalent for such a pump when such "doctor" has pipes attached to it leading to the upper and between decks, such pipes being provided with hose and valves, according to law, but the pipes and hose shall in no case be less than 1½ inches in internal diameter. The pumps for supplying the boilers shall in no case be considered as an equivalent for the double-acting steam fire pump, on steamers above 50 gross tons.

114.13 Connecting, bilge, and sounding pipes; hose tests. All steam fire pumps required shall be supplied with connecting pipes leading to the hold of the vessel with stop-cocks or shut-off valves attached and so arranged that such pumps may be used for pumping and discharging water overboard from the hold.

Each and every steam vessel shall be fitted with a bilge pipe leading from each compartment of the vessel and connecting with a suitably marked valve to the main bilge pump in the engine room, and each compartment of all steam vessels shall be fitted with suitable sounding pipe, the opening of which shall be accessible at all times, except that in compartments accessible at all times for examination no sounding tubes are necessary.

Steam siphons may be substituted in each compartment for the bilge pipes.

All hose required on steam vessels for fire purposes shall be tested to a pressure of 100 pounds to the square inch at each inspection, and it shall be the duty of the Officer in Charge, Marine Inspection, at each annual inspection to see that the couplings are securely fastened to the hose by suitable external or internal clamps, and at least one length of such hose shall be kept at all times attached to each outlet of the fire main and provided with a suitable nozzle. *Provided,* That on freight steamers where the keeping of such hose coupled on interferes with the loading or unloading of cargo they may be removed during such loading or unloading.

114.14 Fire mains and hose connections. All pipes used as mains for conducting water from fire pumps on steam vessels in place of hose shall be of steel, wrought iron, brass, or copper with wrought iron, brass, or composition hose connections

114.14a Pumps on motor vessels Motor vessels of fifty gross tons and over carrying passengers for hire shall be equipped with pumps for throwing water according to the tonnage as described in § 61.5 for steam vessels and equipped as prescribed in §§ 61.5 to 61.7, inclusive, as they now exist or may hereafter be amended

114.14b Fire-fighting equipment on vessels using oil as fuel. (a) On all vessels of 500 gross tons and over, using oil as fuel, there shall be in each fireroom a metal tank containing 10 cubic feet of sand, fitted with a scoop or shaker, for fire purposes, also two or more approved fire extinguishers of the carbon dioxide (CO₂) type, of not less than 15 pounds capacity each, or two foam type fire extinguishers of not less than 2½ gallons capacity each

(b) On all vessels of less than 500 gross tons, using oil as fuel, there shall be in each fireroom a metal tank containing not less than 5 cubic feet of sand, fitted with a scoop or shaker, for fire purposes, also one carbon dioxide fire extinguisher of not less than 15 pounds capacity, or one foam type fire extinguisher of not less than 2½ gallons capacity

114.15 Portable fire extinguishers All vessels carrying passengers, including pleasure vessels, shall be provided with such number of good and efficient portable fire extinguishers, approved by the Commandant as is hereafter prescribed, viz

Vessels less than 150 feet in length shall have at least two fire extinguishers on each passenger deck, vessels 150 feet and over in length shall be provided with at least one fire extinguisher for every 150 linear feet of corridor length or fraction thereof, in the spaces occupied by passengers and crew. In all public spaces extinguishers shall be located not more than 150 feet apart

Freight and towing vessels shall be provided with chemical fire extinguishers as hereafter described, viz

	<i>Minimum number of fire extinguishers</i>
Vessels of over 15 and not over 50 gross tons.....	1
Vessels of over 50 and not over 100 gross tons.....	2
Vessels of over 100 and not over 500 gross tons.....	3
Vessels of over 500 and not over 1,000 gross tons.....	6
Vessels of over 1,000 gross tons.....	8

The above tables of required fire extinguishers are based on the capacity of the ordinary machine, which is about 2½ gallons, and no fire extinguisher of larger capacity shall be allowed a greater rating than that of the ordinary machine. Fire extinguishers of approved types of less capacity are allowable under the above tables when their total contents equal the required quantity

All vessels carrying passengers which transport automobiles or motor vehicles the motive power of which is generated by any of the products of petroleum or other inflammable liquids shall carry, in addition to the chemical fire extinguishers required by the preceding table for vessels carrying passengers, an approved carbon dioxide, foam type or carbon tetrachloride fire extinguisher which has demonstrated a capacity for extinguishing burning oils, burning gasoline, and other burning products of petroleum, in accordance with the following table

Automobiles or motor vehicles carried	Carbon dioxide or foam-type fire extinguishers	Carbon tetrachloride fire extinguishers	Automobiles or motor vehicles carried	Carbon dioxide or foam-type fire extinguishers	Carbon tetrachloride fire extinguishers
1 and not over 5.....	1	4	21 and not over 30....	4	8
6 and not over 10.....	2	5	31 and not over 40....	5	10
11 and not over 20.....	3	6	41 and not over 50....	6	12

For each additional 20 automobiles or motor vehicles, or fraction thereof, add one carbon dioxide or one foam or two carbon tetrachloride fire extinguishers

The requirements may be reduced to 25 percent, but not less than one of either, when an efficient overhead water-sprinkling system, a carbon dioxide, or a foam system with sufficient hose to reach all parts of the deck where automobiles or motor vehicles are carried is installed, said systems to be installed in accordance with drawings or blueprints and specifications approved by the Coast Guard District Commander of the district having original jurisdiction

When a vessel is provided with enough fire extinguishers to take care of all the automobiles or motor vehicles that can be carried, no extra fire extinguishers shall be required for any number of motorcycles carried

Extra safety-valve units shall be carried on board for 50 percent of hand fire extinguishers of the foam type, and extra charges shall be carried on board for 50 percent of each class of fire extinguishers provided. If 50 percent of each class of fire extinguishers carried gives a fractional result, extra charges and extra safety-valve units shall be provided for the next largest whole number

Example

Fire ex- tinguishers carried	Extra charges required	Fire ex- tinguishers carried	Extra charges required
1	1	4	2
2	1	5	3
3	2		

Provided, however, That when provided with carbon dioxide type of fire extinguishers, either an additional carbon dioxide extinguisher or a 2½-gallon foam extinguisher may be furnished. For that 2½-gallon foam extinguisher no extra charge will be required

There shall also be carried on board a complete recharge for any fixed or built-in fire-extinguishing system that has been approved by the Commandant, except systems for engine rooms, fire rooms, and cargo holds

Fire extinguishers shall be located in such parts of the vessels as in the judgment of the Officer in Charge, Marine Inspection, will be most convenient and serviceable in case of emergency, and so arranged that they may be easily removed from their fastenings. Every fire extinguisher thus provided for shall be discharged and examined at each annual inspection. *Provided,* That carbon tetrachloride fire extinguishers shall be tested for their pumping efficiency and the liquid discharged with proper care so that it may be replaced in the extinguishers. Carbon dioxide fire extinguishers shall be checked by weighing to determine contents, and, if found to be more than 10 percent under required contents of carbon dioxide, shall be recharged

Every fire extinguisher provided for and required by this section shall be tested by the Bureau of Standards, Department of Commerce, and a report made by that bureau to the Commandant, who shall then determine whether the said extinguisher shall be approved for use on vessels subject to inspection

Every fire extinguisher approved after September 5, 1933, for use on vessels under the jurisdiction of the Coast Guard shall have affixed thereto a metallic name plate having plainly stamped thereon the name of the fire extinguisher, the rated capacity in gallons, quarts, or pounds, and the name and address of person or firm for whom approved, and the identifying mark of the actual manufacturer

Recharges, particularly the acid, used in charging soda-and-acid type of fire extinguishers, must be packed in such manner that the filling operation (i. e., in recharging the

extinguisher) can be performed without subjecting the person doing the recharging to undue risk of acid burns and shall be contained in Crown stopper type of bottle

114 15a Water-sprinkling systems On and after December 31, 1916, all steamers carrying passengers, and which also carry freight upon the main deck which is accessible to passengers or crew while being navigated, shall have installed in such main-deck freight space an efficient overhead water-sprinkling system

The crew and passenger sleeping accommodations located below the main deck on steamers engaged in the passenger traffic shall have installed therein an efficient overhead water-sprinkling system, unless such quarters and the bed frames therein are constructed of metallic or noncombustible material, thereby making them practically fire proof

On steamers carrying passengers where the kitchens or galleys are located below the main deck, there shall be installed in such kitchens or galleys an efficient overhead water-sprinkling system This paragraph shall become effective July 1, 1917

The water-sprinkling system above referred to shall be reliable and efficient and so located that the volume of discharge shall be sufficient to entirely cover or blanket the freight in case of fire, and to entirely and fully sprinkle the compartment in which the passengers or crew may be accommodated below deck, and be installed in such manner as to be easily and quickly accessible of operation, and shall be ready for service at all times when freight or passengers are on board The operating valves for the sprinkling system shall be suitably marked

114 16 Fire-detecting, alarm, automatic sprinkler, and patrol systems, new and existing vessels (a) (1) All passenger vessels with berth or stateroom accommodations for 50 or more passengers shall be fitted, unless deemed unnecessary by the Commandant for the proper protection of life, with an automatic water-sprinkling system of a type approved by the Commandant, which system shall be so installed as to protect all enclosed parts of the vessel accessible to passengers or crew while the vessel is being navigated, except cargo holds, machinery spaces, and when of fire-resisting construction, toilets, bath rooms, and spaces of similar construction

Where, in the case of a particular vessel, the Commandant does not consider the installation of an automatic water-sprinkling system necessary, such vessel shall be protected in such enclosed parts of the vessel as the Commandant shall deem necessary, with an automatic electric or pneumatic fire-detecting and alarm system, used singly or in combination, of a type approved by the Commandant

(2) All passenger vessels of more than 150 feet in length having berth or stateroom accommodations for less than 50 passengers, shall be fitted with an automatic fire-detecting and alarm system of a type approved by the Commandant Such system may be electric, pneumatic, automatic sprinkler or a combination of each

(b) (1) All passenger vessels having berth or stateroom accommodations for passengers shall be provided with an efficient supervised fire patrol system of an approved type which will record the time of each visit to each recording station, unless the stations are so inter-related as to require operation of all stations of a route in a fixed order, in which case the record shall show the time of start and finish of each tour

(2) The date of both the night and morning portions of the patrol shall be entered on the record The records shall be available for review by inspectors for a period of 6 months after the date to which such records refer

(3) The station boxes shall have seals placed over the securing screws in order to leave evidence of removal or tampering The number and location of recording stations, the order in which they are visited, and the number undertaken by one patrolman shall be approved by the Commandant

(4) Where the system is not equipped with a recording apparatus in the control station¹ the patrolmen shall report to the bridge every hour

(c) All passenger vessels of more than 150 feet in length having berth or stateroom accommodations for passengers which are not equipped with a fire-detecting system in cargo spaces, shall be equipped with an approved smoke-detecting system in all cargo spaces which are inaccessible to passengers or crew while the vessel is being navigated. Cargo spaces which are accessible to passengers or crew while the vessel is being navigated shall be equipped with a water-sprinkling system.

(d) All passenger vessels with sleeping quarters for passengers shall be provided with an approved manual fire alarm system which operates alarm bells in the pilot house, engine room, and emergency squad quarters where provided. The manual fire-alarm system shall be installed in accordance with the plans approved by the Commandant and shall have a suitable number of stations on all decks so as to enable the patrolman to give the alarm immediately in case of fire.

114.17 Fire-detecting and automatic sprinkling systems—(a) Provisions common to all systems—(1) General. (i) All devices and equipment installed shall be of a type and character suitable for marine use, and shall be approved by the Commandant.

(ii) In addition, parts and samples of any equipment shall be submitted by the manufacturers for test purposes, upon request of the Coast Guard.

(iii) Furthermore, all apparatus, devices, and circuits of/as a complete system shall withstand a 60-day endurance test without repair, one-half of which time shall be at sea service.

(iv) Fire-alarm systems shall not be used for the transmission of other than fire-alarm signals.

(v) Systems shall be normally free of electrical grounds.

(vi) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the American Institute of Electrical Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions. All conductors shall be lead sheathed to protect against moisture and conductors exposed to mechanical injury shall be leaded and armored. Lead-sheathed conductors may be used for voltages of 60 volts or less. In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermostats in each thermostat zone, but approved multiconductor cable may be used to connect the several individual zones to the annunciator panel.

(2) Maintenance and test. (i) With each equipment there shall be furnished a framed chart which shall be visible in the wheelhouse at all times, bearing full instructions for operation, maintenance, and test of the system.

(ii) This chart shall bear tabulated spaces for the date and signature of a licensed officer of the ship who shall witness or conduct tests of the system at intervals not less frequent than required in the specification forming part of the Commandant's approval. It is recommended that periodic inspections be made by the manufacturer of the equipment.

(iii) The chart shall list the minimum spare material which is required in each equipment in the specification forming part of the Commandant's approval.

(3) Classification. Protection shall be provided by systems of the following types, used singly or in combination.

(i) Electrical system, using thermostats or thermostat wire operating by heat to produce visual and audible signals.

(ii) Pneumatic-tube system, using thermostats composed of copper tubing containing air, the expansion of which produces visual and audible signals.

¹ Those stations in which a 24-hour watch is maintained and in which, (1) navigating equipment is located, or (2) radio equipment is located, or (3) central fire station where fire recording instruments are located.

(iii) Smoke-pipe system, in which fire is indicated visually and by the sense of smell by smoke drawn through pipes and suitably illuminated

(b) **Electrical and pneumatic-tube systems**—(1) **Scope of installations** (i) For vessels 150 feet and under in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or in the engine room

(ii) For vessels above 150 feet and under 350 feet in length, systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or chart room, and shall provide an auxiliary audible alarm in the engine room

(iii) For vessels 350 feet or more in length, systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or chartroom or in a fire station in which a 24-hour watch is kept, and shall provide an auxiliary audible alarm in the engine room

(iv) Annunciators or other indicators shall be clearly marked to show the fire-alarm circuit protected and shall indicate or function until manually restored

(2) **Location of detectors, electrical system** (i) Detectors (thermostats) shall be installed overhead in the high point of each compartment protected. At least one detector shall be installed in each such compartment. Detectors (thermostats) shall not be approved for use in cargo compartments or other inaccessible places after June 30, 1933, unless satisfactory provision is made to replace them without ingress to the compartment in which they are located

(ii) On smooth ceilings, detectors shall be spaced not over 15 feet apart and the area protected by a single detector shall not exceed 200 square feet, and no point on the ceiling shall be more than 10 feet away from the detector. For the detectors of the wire type each circuit shall consist of a continuous length of thermostat wire not exceeding 1,000 feet in length. The thermostat wire shall extend into each compartment protected and no point on the ceiling shall be more than 10 feet away from the thermostat wire

(iii) Thermostat wire shall be run directly on the ceiling or within 12 inches of the ceiling on partitions or bulkheads. In cargo compartments all fire-indicating apparatus shall be installed overhead and not on the ship's side or on bulkheads

(iv) Ceilings divided into panels or bays by beams not more than 8 inches deep shall be regarded as smooth ceilings, otherwise each bay shall be regarded as a separate ceiling

(v) Where these spacing requirements are impracticable because of unusual beam structures, special instructions shall be obtained from Headquarters

(vi) All detectors in cargo spaces, or otherwise subject to mechanical injury, shall be suitably protected by substantial steel protectors crossing over in front of detectors and fastened to beams or brackets or the equivalent

(vii) As required by the Coast Guard, from 3 to 6 spot thermostats for fire-detecting systems installed prior to January 1, 1935, and at subsequent intervals, shall be supplied for test purposes, and if found lacking in sensitivity the entire installation of thermostats shall be replaced

(3) **Location of detectors, pneumatic-tube system** (i) Each circuit shall consist of a continuous length of pneumatic tubing, not exceeding 1,000 feet in length, without branches or alternative paths

(ii) Tubing shall be run directly on ceilings or within 12 inches of ceiling on partitions or bulkheads. In cargo compartments all fire-indicating apparatus shall be installed overhead and not on the ship's side or on bulkheads

(iii) In every inclosed space or separate room there shall be exposed at least 5 percent of total length of tubing or circuit.

(iv) In no case shall less than 25 feet of exposed tubing be used in any inclosed space or separate room

(v) On smooth ceilings no point on the ceiling shall be more than 12 feet from nearest point of tubing

(vi) Ceilings divided into panels or bays shall be regarded as smooth ceilings, provided beams are not more than 8 inches deep, otherwise at least one line of tubing shall be run in each bay

(vii) Where these spacing requirements are impracticable because of unusual beam structures, special instructions shall be obtained from Headquarters

(viii) Where necessary, tubing shall be protected against mechanical injury

(ix) Tubing shall be inclosed in conduit or otherwise heat insulated where this is necessary in order to properly isolate signals

(4) **Zoning** (i) A single fire-alarm circuit shall not include more than 50 individual rooms or storage lockers

(ii) Spaces separated by watertight or main vertical zone bulkheads shall not be included in the same fire alarm zone Further, a fire alarm zone shall not include spaces on more than one deck except in the case of peak spaces having a combined ceiling area not exceeding 3,000 square feet, or in the case of a system with indicators for individual spaces

(iii) Systems shall be so designed that one circuit becoming inoperative will not affect the operation of any other circuits

(iv) The system shall be so arranged as to permit one or any number of fire-alarm signals simultaneously, and an alarm on any one circuit shall not interfere with the operation of any other circuit

(5) **Supervision** (i) The source of energy and all electrical circuits, except as hereinafter provided, shall be under constant electrical supervision In event of failure of the source of energy or a break in any supervised circuit a distinctive trouble signal or fire-alarm signal shall sound continuously until the trouble is corrected No switch for silencing this signal shall be provided unless its operation transfers the signal to a trouble lamp

(ii) All trouble circuits, the source of energy for trouble circuits, and normally open secondary circuits on control panels incased in metal protection need not be supervised

(iii) The thermostats themselves need not be supervised if connected in multiple

(iv) A fire gong shall be supervised When multiple fire gongs are used, at least one shall be supervised

(6) **Current supply.** (i) The source of energy for the fire-alarm system, including supervisory circuits, shall consist of a storage battery of sealed cells automatically charged from the main bus bars of the lighting system, and used for no other purpose

(ii) The supply voltage shall be not less than 20 volts The system shall be able to operate at 80 percent of normal voltage

(iii) The capacity of the storage battery shall be sufficient to supply the system for at least 48 hours without recharging, and shall be not less than 10 ampere hours

(7) **Fuses** Approved fuses of not less than 3-ampere nor more than 6-ampere capacity shall be provided at or near the bus bars from which the charging current is taken and on charging panel in main discharge leads of battery

(8) **Control panels and devices** (i) All panels and devices shall be capable of operating when inclined to an angle of 45° Operation shall not be affected by vibration

(ii) Audible signals shall be produced on vibrating fire-alarm bells of inclosed type with gongs not less than 6 inches in diameter.

(iii) Provision shall be made for silencing the fire-alarm bell by means of a switch operating when the door of the control-panel cabinet is open at least 3 inches, or by equivalent means

(c) **Smoke-pipe systems**—(1) **Scope of installations** Systems of this type shall provide a detecting device to which all smoke pipes shall lead, which device shall be located in the wheelhouse, in a fire-control station in which a 24-hour watch is kept, or in convenient proximity to the valves of the extinguishing system, provided there are transmitted to the wheelhouse or fire-control station means for determining the compartment reporting the alarm and audible alarms are provided as required in this section

(2) **Construction and installation** (i) The detecting device shall be such that finely divided and diluted particles of smoke shall be readily indicated visually The lighting arrangement shall be such as not to be disturbing to navigation at night For new installations on vessels of over 5,000 gross tons or where installations are not made in the wheelhouse or fire-control station, this device shall be provided with an audible alarm in the wheelhouse together with an auxiliary audible alarm located in the engine room

(ii) Smoke collectors shall be installed overhead in each compartment protected and shall be so located that no point on the overhead deck is more than 40 feet from a collector The indicating pipes or tubing shall be not smaller than three-fourths inch inside diameter When more than one smoke collector is required for a compartment, not more than two collectors may be connected to one indicating pipe Each compartment shall have one or more indicating pipes extending to the detecting device, except that the pipes from small adjacent compartments not exceeding a combined volume of 5,000 cubic feet may be joined No smoke collectors shall be located nearer to the edge of the opening of a ventilator than three times the diameter or equivalent diameter of the opening

(iii) Sufficient quantity of the exhaust shall discharge into the wheelhouse or fire station to permit the detection of fire by odor, and a valve plainly marked and readily operable from that compartment shall be provided to direct the exhaust, if obnoxious, to the outside Where the detecting cabinet is not installed in the wheelhouse or fire station the residual exhaust shall be discharged in the vicinity of the detecting cabinet

(iv) Suction fans shall be furnished in duplicate, and shall be provided with switches to permit their operation from the emergency lighting circuit Where the emergency lighting voltage is less than the normal lighting voltage, one fan shall be so arranged that it may be operated from either source

(v) A trouble signal located in the fire-control station or the wheelhouse shall be provided which will indicate the inability of the system to report a smoke alarm

(vi) Where exposed to injury in cargo compartments the collectors and smoke pipes shall be reasonably protected against injury

(vii) All smoke pipes shall be installed to grade to low points and at low points provided with drains These pipes shall be run with as easy bends as practicable

(viii) The smoke inlets in cargo holds should be examined periodically by the ship's personnel to determine whether inlets are obstructed by corrosion, paint, dust, or other extraneous condition Smoke tests should be made in all holds and the operation of the system noted

(d) **Automatic sprinkling system** (1) The sprinkling system shall, where practicable, consist of pipe fitted with sprinkler heads at suitable distances that will operate automatically in the event of a fire, and spray water on the surrounding area

(2) The system shall be supplied primarily by a pressure tank or tanks of suitable capacity and maintained at the required pressure, and secondarily by an automatically controlled pump so arranged that when the pressure in the tank falls to a predetermined point the pump will cut in Where a motor-driven sprinkler pump is installed, it shall be capable of being operated from the emergency electrical circuit in case of failure of the main power Any water standing in the system or the tank should be fresh, and in the event the supply to the pump is salt water, appropriate check valves shall be installed to prevent the salt

water entering the tank Provision should be made to cut in any additional pumping equipment under manual control

(3) Sprinkler systems shall be zoned, and means shall be provided for giving an alarm where it can be most quickly observed by officers or crew in case of water flow from sprinklers, low air pressure, closed supply valves, or operation of thermosensitive elements

(4) The automatic sprinklers, alarm valves, and other fire-protection devices to be used in the above system shall be of a type approved by the Commandant, and the entire system shall be installed in accordance with drawings and specifications approved by the Commandant

(5) All tanks installed on or after January 1, 1939, for use in connection with sprinkler systems shall be constructed, tested, and inspected as unfired pressure vessels in accordance with the provisions of parts 50 to 57, inclusive, of this chapter All such tanks which were installed prior to January 1, 1939, shall be tested and inspected as unfired pressure vessels in accordance with the provisions of parts 50 to 57, inclusive, of this chapter

114 18 Oxygen-breathing apparatus, gas masks, and flame-safety lamps. All passenger vessels which are provided with sleeping quarters for passengers shall be provided with oxygen-breathing apparatus, gas masks, and flame-safety lamps as follows

(a) Vessels with 50 to 100 staterooms for passengers, one oxygen-breathing apparatus or one gas mask

(b) Vessels with more than 100 staterooms for passengers, two oxygen-breathing apparatus or two gas masks and a flame-safety lamp

(c) Oxygen-breathing apparatus or gas masks shall be kept in operative condition in an accessible place, and, where more than one is carried, in widely separated places

(d) The master and chief engineer shall train a sufficient number of officers and crew in their respective departments in the use of the equipment

(e) Only oxygen-breathing apparatus and flame-safety lamps that have been approved by the Commandant may be used

(f) Oxygen-breathing apparatus shall be of at least one-half-hour-period type, and gas masks shall have the approval of the Commandant

(g) One extra cylinder for each oxygen-breathing apparatus and one extra canister for each gas mask shall be carried

(h) The gas mask mentioned above shall be of an approved type which provides full protection against carbon monoxide and other gases

(i) All vessels equipped with refrigeration of any kind shall carry one gas mask of a kind giving protection against the refrigerant used in addition to the breathing apparatus

114 21 Lubricating oils Lubricating oils for use on board the vessel shall be stored in secure tanks, casks, or cans in the engine-room compartments or storeroom, or in metal-lined lamp lockers or oil rooms Effective on and after April 9, 1941

114 22 Fire extinguishers for emergency power plants In compartments where emergency lighting and wireless units are located, two approved fire extinguishers of either carbon tetrachloride, carbon dioxide, or foam type shall be permanently located at the most accessible point In addition, two fire extinguishers of the above types shall be permanently located so as to be readily accessible to the emergency fuel tanks containing gasoline, benzene, or naphtha

114 22a Fire-resisting bulkheads All passenger vessels shall be fitted above the bulkhead deck with fire-resisting bulkheads which shall be continuous from side to side of the vessel and arranged to the satisfaction of the Coast Guard For additional requirements see Part 144—Construction or Material Alteration of Passenger Vessels of the United States of 100 Gross Tons and Over Propelled by Machinery of this chapter

114 23 Construction of motion picture booths—(a) Booths Apparatus for projecting motion pictures using inflammable (nitrocellulose) film or slow-burning (acetate cellulose) film shall be contained in a fire-resistive booth or inclosure. It shall be not less than 7 feet in height and of horizontal area not less than 30 square feet for each projector. It shall not be located nearer than 10 feet to the principal exits of the room.

(1) **Construction of booth** The framework shall be constructed of structural steel angles or T irons not less than $1\frac{1}{2}$ inches by $1\frac{1}{2}$ inches by $\frac{1}{4}$ inch, spaced not more than 2 feet apart, or 2 inches by 2 inches by $\frac{1}{4}$ inch, when spaced from 2 feet to 4 feet apart, and shall be suitably braced to withstand lateral strains. It shall be securely anchored to the deck. The top and sides of the booth shall be covered on the inside of the steel frame with a metal sheet not thinner than No. 20 gage, inside of which is placed asbestos millboard not less than $\frac{1}{4}$ inch thick, all properly secured to the framework. Transite asbestos boards or asbestos wood may be used without the sheet-metal covering, provided the distance between supports for the $\frac{1}{4}$ inch thickness does not exceed 2 feet, for the $\frac{1}{2}$ inch thickness, 3 feet, for the $\frac{3}{4}$ inch thickness, 4 feet. The door shall be constructed similar to the booth, and shall be not less than 2 feet wide and 5 feet high, shall be self-closing, fit its frame tightly, and be provided with proper latches. The floor shall be covered with one thickness of $\frac{3}{8}$ inch asbestos millboard or transite board.

All joints shall be made smokeproof.

(2) **Openings in booth.** The booth shall be provided with a ventilating inlet on each of the three sides, each to be about 15 inches long and 3 inches high, covered on the outside with wire netting of mesh not greater than $\frac{1}{8}$ inch, securely fastened to the wall. In the top of the booth shall be located an air-outlet opening of not less than 100 square inches for each projector connected by a fire-resistive flue to a safe distance above the top deck if the booth is located below deck. The flue shall be securely supported on the framework of the booth. This is designed to provide for an air current through the booth, when operating, of 30 or more cubic feet per minute. If in the given location this is not accomplished, artificial ventilation, as by means of a fan within the booth, shall be introduced.

Two openings shall be provided at the front of the booth, one for the machine and the other for observation by the operator, the maximum area of each opening not to exceed 70 square inches. These openings as well as the air inlets near the bottom of the booth shall be provided with gravity doors made of iron or steel not less than $\frac{3}{8}$ inch in thickness, of size to overlap the openings by at least 2 inches, and arranged to slide without binding in properly constructed grooves, the joint between door and wall to be smoke-tight when doors are closed, said doors to be held open normally by the use of a fine combustible cord fastened to a fusible link located above the projector which melts at a temperature of 71° C (160° F), the whole being so arranged that the doors will close automatically upon severing of the cord or the fusing of the link. Provision shall also be made for closing said doors by hand from the outside of the booth.

(3) **General requirements.** All films on board shall at all times be kept within the operating booths, except as otherwise herein provided. They shall be contained in individual metal boxes, except for the film in the machine and the film immediately before it is placed in or immediately after removal from the machine. Where not over five 5-pound reels are present in the booth they may be placed on incombustible shelves, suitably secured against displacement by the motions of the boat. Where more than 5 reels but not more than 10 reels are present, they shall be kept in closed shelves or cabinets similar in construction to that of the walls of the booth. Where more than ten 5-pound reels are present, they are to be stored in an insulated film cabinet, the cabinet to be constructed per appended specifications.

All rewinding and repair of film shall be conducted within the projecting booth, unless a place with equal safeguards is provided.

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When in use the door of the booth shall be closed and when not in use it shall be locked

The projecting machine is to be suitably secured against displacement by the motions of the boat. All electric wiring and connections shall conform with accepted standards for the given purpose (National Electric Safety Code or National Electric Code). No smoking, matches, or lights other than properly guarded electric lights shall be permitted within the booth.

(b) **Cabinets** (1) The size of a cabinet for the temporary storage of films on board shall not exceed 10 cubic feet, and shall not be used for storage at one time of more than forty 5-pound reels. The reels shall be contained within suitable metal containers and be held on racks in such manner as not to be displaced by the motions of the boat.

(2) The cabinet shall be constructed of incombustible materials throughout and shall be tightly enclosed. It may be of sheet iron of not less than No. 18 U. S. gage, stiffened with angle irons, double walled, with not less than 2 inches of space between walls, filled with incombustible insulating material, or equivalent construction. The door shall be constructed equivalent to the walls of the cabinet, shall be self-closing, fit closely, and be kept closed and locked at all times except when films are being removed from or placed in the cabinet. If the cabinet is located within the booth, the door of the cabinet shall open outward through the wall of the booth, with tight joints between the booth wall and the cabinet or door. The cabinet shall otherwise be kept in a hold for the storage of hazardous materials. The cabinet shall be secured to the deck by fastenings attached to the outer angle irons.

(c) **Fire extinguisher required.** At least one fire extinguisher of a kind approved by the Commandant shall be placed near every such booth and be accessible at all times.

(d) **Motion-picture projectors** (1) Motion-picture projectors of the 16 mm. or 8 mm. size, using only slow-burning films, need not be of an approved type and may be used on inspected vessels without booths.

(2) Motion-picture projectors using the 35-mm. size films shall only be used in booths, constructed in accordance with the specifications in paragraph (a) of this section and must be of an approved type.

114 24 Regulations to guard against and extinguish fire reestablished. The regulations in this part to guard against and extinguish fire, in effect on April 8, 1941, established under the authority of Title LII of the Revised Statutes of the United States (R. S. Sections 4399-4500, inclusive), are hereby reestablished under the authority of section 2 (a) of the act of October 9, 1940 (46 U. S. C. 463a), and effective on and after April 9, 1941.

114 25 Liquefied petroleum gases for cooking and heating—(a) Liquefied petroleum gas (definition) For purposes of this section "liquefied petroleum gas" shall be defined as any liquefied inflammable gas which is composed predominantly of hydrocarbons or mixtures of hydrocarbons, such as propane, propylene, butanes, butylenes, and butadienes, and which has a Reid ¹ vapor pressure exceeding 40 pounds per square inch absolute or a vapor pressure exceeding 25 pounds per square inch gage at 100° F., as determined by the Natural Gasoline Association of America's ² method or other recognized test method.

(b) **Approvals.** Liquefied petroleum gas may be used on inspected vessels, except passenger vessels *Provided,*

(1) Gas consuming appliances are approved for use of liquefied petroleum gas by the American Gas Association Testing Laboratories (as indicated by label or seal of approval for liquefied petroleum gas on stationary installations) and are also approved by the Commandant.

¹ American Society for Testing Materials Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method) (D-323), most recent revision.

² Natural Gasoline Association of America Tentative Standard Method for Determination of Vapor Pressure of Liquefied Petroleum Gas Products, most recent revision.

(2) Cylinders or drums in which liquefied petroleum gas is stored and handled shall comply with Interstate Commerce Commission specifications and retest requirements for the specific gas filled therein

(3) The relief valves, shut off valves, excess flow valves, pressure regulators, and vaporizer, when used, shall conform to the requirements of and bear the label of the Underwriters Laboratories, Inc., or other recognized testing laboratory

(4) The location and installation of gas burning appliances, gas cylinders and regulating equipment, together with all piping must be approved by the Commandant

(c) **Odorization of gas** All liquefied petroleum gas used on vessels shall be effectively odorized by an agent of such character as to indicate positively by a distinctive odor the presence of gas down to a concentration in air of not over $\frac{1}{4}$ the lower limit of combustibility

(d) **Location and security of containers** (1) Cylinders shall be located in a substantially constructed and firmly fixed metal inclosure located on or above the weather deck level. Access to this inclosure shall be from the weather deck only. This inclosure shall be so constructed that when the access opening is closed any gas leakage can escape only through a top and bottom ventilating system which shall consist of a fresh air inlet pipe and an exhaust pipe both entering the inclosure from above

(2) Cylinders or drums located within the metal inclosure shall be suitably secured in place

(3) Storage of spare and empty cylinders must be within the metal inclosure or they must be properly chocked on the weather deck

(e) **Valves and regulators** (1) A spring loaded relief valve shall be incorporated in the system, its size and pressure setting to be according to Interstate Commerce Commission's requirements, and it shall be located and vented within the metal inclosure. This relief valve must be located on or between the cylinder and the pressure regulator

(2) The low pressure side of all pressure regulators shall be protected against excessive pressure by means of a suitable relief valve which shall discharge into the metal inclosure

(3) All regulator vents must discharge into the metal inclosure

(4) All valves and regulators embodied in the system for the purpose of pressure relief, regulation, and control of gas pressure and flow rates, shall be securely mounted in positions readily accessible for inspection, maintenance, and testing

(5) Valves in the assembly of multiple cylinder systems shall be so arranged that the change of cylinders may be made without shutting down the system

(6) A shut off valve shall be installed in each branch connection

(f) **Vaporizers** Where a vaporizer is required approval shall be obtained from the Commandant

(g) **Piping and fittings** (1) All piping shall be installed so as to provide minimum interior runs with adequate flexibility

(2) The piping between the cylinders and the appliances shall be seamless annealed copper tubing or any other tubing approved by the Commandant. The tubing connections shall be flared and the number held to a minimum

(3) All piping or tubing shall be tested (such as with a manometer employing water) after assembly and at each annual inspection and proved free from leaks at not less than normal operating pressures. Tests may be made by qualified persons acceptable to the Officer in Charge, Marine Inspection, and one copy of a report of such test shall be posted and another copy forwarded to the Officer in Charge, Marine Inspection, in the district in which the test was made

(h) **Ventilation of compartments having gas appliances.** (1) Compartments which are located above the weather deck and which contain gas consuming devices shall be ventilated by openings to the outside near the deck level and by openings overhead or near the overhead in the compartment. Mechanical ventilators may also be provided

(2) Where compartments in which gas consuming devices are located are entirely below the weather deck, mechanical ventilation shall be provided with sufficient capacity to effect a change of air at least once every six minutes

(i) **Identification and instructions** (1) The outside of metal inclosure housing liquefied petroleum gas cylinders, valves and regulators shall be marked

Liquefied Petroleum Gas
Keep Open Fires Away
Operating Instructions
Inside and In-----

(2) Operating Instructions shall be framed under glass and shall be posted prominently, both in the interior of the metal inclosure and near the most frequently used gas consuming device so they may be easily read

(j) **Operating instructions** (1) Before opening a cylinder valve, the outlet of cylinder shall be connected tightly to system, and, in the case where only a single cylinder is used in the system, all appliance valves and pilots must be shut off before the cylinder valve is opened

(2) Before opening cylinder valve after connecting it to system, the cylinder shall be securely fastened in place

(3) When cylinders are not in use their outlet valves shall be kept closed

(4) Cylinders when exhausted shall have their outlet valves closed

(5) Nothing shall be stored in the metal inclosure except liquefied petroleum gas cylinders and permanently fastened parts of the system

(6) Valve protecting caps if provided shall be firmly in place on all cylinders not attached to the system Caps for cylinders in use may remain in metal inclosure if rigidly fastened to the metal inclosure structure

(7) The opening into the metal inclosure must be closed at all times except when access is required to change cylinders or maintain equipment

(8) Gas pressure to consuming devices should be approximately eleven inches water column (6 4 oz per square inch)

(9) No smoking should be permitted in the vicinity of the metal inclosure when access to inclosure is open

(10) If electric connections are made within the metal inclosure they must be installed in strict accordance with the requirements of the National Electrical Code¹ for Class I, Group D, Hazardous Locations

(11) Tests for gas leaks should be made with a soap solution or low freezing point liquids but in no case shall a flame be used

(12) Report any presence of gas odor to -----

¹ A copy of this Code, National Board of Fire Underwriters' pamphlet No 70 has been filed with this document in the Division of the Federal Register Copies are also on file with the various Coast Guard District Commanders for reference purposes

PART 115—SPECIAL OPERATING REQUIREMENTS

<p>See</p> <p>115 12a Notice to mariners, aids to navigation</p> <p>115 16 Notice of casualty and voyage records</p> <p>115 17 Persons allowed in pilothouse and on navigator's bridge</p> <p>115 18 Station bills, drills, and reports of masters</p> <p>115 19 Steering-gear tests</p> <p>115 19a Steering orders</p> <p>115 20 Unnecessary whistling</p> <p>115 21 Alaskan river signal</p> <p>115 22 Pilothouse watch</p> <p>115 23 Cabin watchmen and fire patrolmen</p> <p>115 24 Flashing the rays of a searchlight or other blinding light</p> <p>115 25 Unauthorized lights</p>	<p>See</p> <p>115 26 Sanitation</p> <p>115 27 Steam vessels requiring licensed masters</p> <p>115 32 Duties of mates of inland steamers</p> <p>115 36 Tonnage of steam vessels on which pilots may act</p> <p>115 37 Pilots governed by rules</p> <p>115 44 Examination of boilers and machinery by engineer</p> <p>115 45 Reports of accidents, repairs, and unsafe boilers and machinery by engineers</p>
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CROSS REFERENCE

Definition of terms See § 113 01

NOTE The rules and regulations regarding the examinations for and the issuing of licenses, certificates, raising of grade, etc., and other matters relative to merchant marine personnel are contained in a separate publication entitled "Rules and Regulations for Licensing and Certificating of Marine Personnel "

Section 115.12a Notice to mariners, aids to navigation (a) Licensed officers are required to acquaint themselves with the latest information published by the Coast Guard and the United States Navy regarding aids to navigation, and neglect to do so is evidence of neglect of duty. It is desirable that vessels navigating oceans and coastwise and Great Lakes waters shall have available in the pilot house for convenient reference at all times a file of the applicable Notice to Mariners. All vessels shall have charts of the waters on which they operate available for convenient reference at all times.

(b) Notice to Mariners published weekly by the Coast Guard which contains announcements and information regarding aids to navigation and charts of waters of the United States is available for free distribution at the following places: Field offices of the Coast Guard, United States Coast and Geodetic Survey field stations, and the Marine Division, Customhouse. Notice to Mariners published weekly by the United States Navy for the correction of charts, sailing directions, light lists, and other publications, and which includes foreign waters and certain waters of the United States, is available for free distribution at the Hydrographic Office, Branch Hydrographic Offices, or any of the agencies of seaboard ports, and is also on file in the United States consulates where they may be inspected.

115 16 Notice of casualty and voyage records (a) The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the U S Coast Guard whenever the casualty results in any of the following:

- (1) Damage to property in excess of \$1,500 00
- (2) Material damage affecting the seaworthiness or efficiency of a vessel
- (3) Stranding or grounding
- (4) Loss of life
- (5) Injury causing any persons to remain incapacitated for a period in excess of 72 hours

(b) The notice required in the above paragraph shall show the name and official number of the vessel involved, the owner or agent thereof, the nature and probable cause of the casualty, the locality in which it occurred, the nature and extent of injury to persons and the damage to property.

(c) In addition to the notice required above, the person in charge of the vessel shall, as soon as possible, report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival *Provided*, That when from distance it may be inconvenient to report in person it may be done in writing only The written report required herein for personal accident not involving death shall be made on Form NAVCG-924E and for all other marine casualties or accidents the written report shall be made on Form NAVCG-2692

NOTE If filed without delay these forms may also provide the notice required by paragraph (a) of this section

(d) The owner, agent, master, or other person in charge of any vessel involved in a marine casualty shall retain such voyage records of the vessel as are maintained by the vessel, such as both rough and smooth deck and engine room logs, bell books, navigation charts, navigation work books, compass deviation cards, gyrocompass records, stowage plans, record of draft, aids to mariners, radiograms sent and received, the radio log and crew and passenger lists The owner, agent, master, or other officer in charge, shall make these records available to a duly authorized Coast Guard officer or employee for examination upon request

(e) Whenever a vessel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection No report on Form NAVCG-2692 is required unless any of the results listed in paragraphs (a) (1) to (a) (5), inclusive, of this section occurs

115 17 Persons allowed in pilothouse and on navigator's bridge (a) Masters and pilots of vessels shall exclude from the pilothouse and navigator's bridge of such vessels while under way all persons not connected with the navigation of the vessel or not engaged in work in those spaces *Provided*, That inspectors of the Coast Guard, licensed officers of vessels, persons regularly engaged in learning the profession of pilot, officers of the United States Coast Guard, United States Navy, United States Coast and Geodetic Survey, and Engineer Department of the United States Army, may be allowed in the pilothouse or upon the navigator's bridge upon responsibility of the Officer in Charge

(b) The master of every vessel carrying passengers and every ferry vessel shall keep three printed copies of this section posted in conspicuous places on such vessel, one of which shall be kept posted in the pilothouse

(c) The Officers in Charge, Marine Inspection, shall be furnished by Headquarters printed copies of this section for distribution

115 18 Station bills, drills, and reports of masters—(a) Station bills and muster lists. It shall be the duty of the master of every vessel carrying passengers and all other vessels of over 500 gross tons and subject to inspection, to cause station bills and muster lists to be prepared which shall be signed by the master who shall be responsible for their preparation The station bills and muster lists shall be posted in conspicuous places in several parts of the vessel, particularly in the crew's quarters, and must contain full particulars of the signals which will be used for calling the crew to their stations for emergency duties Special duties shall be allotted to each member of the crew and the muster lists shall show all these special duties and indicate the station to which each man must go and the duties he has to perform The special duties should, as far as possible, be comparable to the regular work of the individual On passenger vessels where the size of the crew will permit, several members of the crew should be designated as an emergency squad and required to report to the bridge with certain equipment for instructions The duties provided for by the muster lists should include

(1) The closing of airports, watertight doors, fire doors and fire screens, the covers and all valves of all scuppers, sanitary and other discharges which lead through the ship's hull below the margin line, and stopping the fans and ventilating systems

(2) The extinction of fire

(3) The equipment of boats, rafts, and buoyant apparatus and their preparation for launching

(4) The muster of passengers

(i) Warning the passengers

(ii) Seeing that they are dressed and have put on their life jackets in a proper manner

(iii) Assembling the passengers and directing them to the appointed stations

(iv) Keeping order in the passages and on the stairways and generally controlling the movements of the passengers

(b) **Emergency signals** The general fire alarm signal shall be a continuous rapid ringing of the ship's bell for a period not less than 10 seconds supplemented by the continuous ringing of the general alarm bells for not less than 10 seconds. For dismissal from fire alarm stations, the general alarm bells shall be sounded three times, supplemented by three short blasts of the whistle. The signal for boat drill or boat stations shall be more than six short blasts and one long blast of the whistle supplemented by the same signal on the general alarm bells.

Where whistle signals are used for handling boats, they shall be as follows

To lower boats one short blast of the whistle

To stop lowering the boats two short blasts of the whistle

For dismissal from boat station three short blasts of the whistle *Provided, That* on river vessels the whistle signals herein may be made on the ship's bell

The master of any vessel may establish such other emergency signal, in addition to the above, as will provide that all the officers and all the crew and passengers of the vessel will have positive and certain notice of the existing emergency

(c) **Emergency squad** The master may organize a squad to be used for emergency duties (other than a general emergency), or crew practices, and the nature of the signals or other means for assembling the squad remains within the discretion of the master. Such signals should not conflict with the navigational signals or the signals used for a general alarm.

(d) **Drills, tests and inspection** It shall be the duty of the master, or the mate, or officer next in command, once at least in each week, to call all hands to quarters and exercise them in discipline, and (weather permitting) in the unlashng and swinging out of the lifeboats, the closing of all hand- or power-operated watertight doors which are in use at sea, closing all fire doors and fire screens, the use of fire pumps, and all other apparatus for the safety of life on board of such vessels, with special regard for the drill of the crew in the method of adjusting life preservers and educating passengers and others in this procedure, and to see that all the equipments required by law are in complete working order for immediate use, the fact of exercise of the crew, as herein contemplated, shall be entered upon the vessel's log book

The rule relating to fire and boat drills contemplates that such drills shall be conducted precisely as though an emergency existed. To accomplish the purpose of the rule, lifeboat covers and strongbacks shall be removed, plugs or caps put in place, boat ladders secured in position for use, painters carried forward and tended so as to provide a good lead and slack to hold the boat in position under the davits when in the water. The person in charge of each lifeboat or life raft should have a list of its crew and should see that the men under his orders are acquainted with their several duties. The hand pumps and fire pump shall be

operated long enough and a sufficient number of outlets used to ensure that such equipment is in order and effectual. The motor and the hand-operated propeller gear of each lifeboat shall be operated for a period of not less than 5 minutes once at least in every 7 days, in order that it may be ready for service at any time. Such operation shall be a part of the lifeboat drill, and the fact of such operation shall be made a part of the report of such drill. When oxygen-breathing apparatus, gas masks, or other special equipment is carried certain members of the crew shall be trained in the use of the equipment.

(e) **Log book entries** The entries in the vessel's log book relating to the exercise of the crew in fire and boat drills shall state the day of the month and the hour when so exercised, length of time of the drill, number on the boats swung out, number of lengths of hose used, and a statement of the condition of all fire and lifesaving apparatus.

(f) **Penalty** For any neglect or omission on the part of the officer in command of such vessels to strictly enforce the provisions of this section, he may be proceeded against in accordance with the provisions of section 4450, R. S., as amended, looking to a suspension or revocation of his license.

(g) **Additional requirements** It shall be the duty of the inspectors to require the officers and crew of all such vessels to perform the aforesaid drills and discipline in the presence of said inspectors at intervals sufficiently frequent to assure the said inspectors, by actual observance, that the foregoing requirements of this section are complied with.

The master of every passenger vessel shall report monthly the day and date of such exercise and drill, the number of lifeboats on board and the number on the boats that were swung out at each drill, the condition of the vessel and her equipments, and also the number of passengers carried. These reports shall be made to the office of the Coast Guard District Commander of the district where the vessel was last inspected. That officer will forward the reports to the Officer in Charge, Marine Inspection, in which district the vessel operated during the greater part of the month to which the report relates, through the office of the proper Coast Guard District Commander.

Three copies of this section shall be furnished every vessel carrying passengers and one to all other vessels to which this section applies, to be framed under glass and posted in conspicuous places about the vessel.

115 19 Steering-gear tests On all vessels under the jurisdiction of the Coast Guard, the entire steering gear, the whistle, the means of communication, and the signaling appliances between the bridge or pilothouse and engine room shall be examined and tested by a licensed officer of the vessel at least once in every week and an official record kept of the fact and time of such examination and test.

115 19a Steering orders "Right rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the right.

"Left rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the left.

Where rudder indicators are provided, they shall be installed consistent with the foregoing.

115 20 Unnecessary whistling Unnecessary sounding of vessel's whistle is prohibited within any harbor limits of the United States. Whenever any licensed officer in charge of any vessel shall authorize or permit such unnecessary whistling, such officer may be proceeded against in accordance with the provisions of R. S. 4450 (46 U. S. C. 239), as amended, looking to a revocation or suspension of his license.

115.21 Alaskan river signal. The signals between the pilothouse and engine room on Alaskan rivers shall be as follows

When at rest, 1 jingle.....	Stand by
1 stroke of gong.....	Ahead full speed
2 strokes of gong.....	Astern full speed
1 stroke of gong.....	Stop when going ahead or astern
1 stroke of gong and 1 jingle.....	Ahead half speed
2 strokes of gong and 1 jingle.....	Astern half speed
When going astern or ahead half speed, 1 jingle.....	Full speed
When going astern or ahead full speed, 1 jingle.....	Half speed
When going ahead or astern, any speed, 2 jingles.....	Very slow

115.22 Pilothouse watch All passenger and ferry steamers shall, in addition to the regular pilot on watch, have one of the crew also on watch in or near the pilothouse, and this section applies to all steamers navigating in the nighttime

115.23 Cabin watchmen and fire patrolmen Vessels carrying passengers shall during the nighttime keep a suitable number of watchmen in all passenger quarters and on each deck

All watchmen shall be under the direct charge of the master or officer in command of the vessel, and each shall report to the officer in command at the pilothouse at fixed intervals of not longer than every hour

Cabin watchmen and cabin patrols on duty in the nighttime on all vessels shall have in their possession while on such patrol duty a suitable and efficient dry-battery flashlight

The uniform of the night watchman shall be so conspicuous as to be readily distinguished from other persons, and the coat or sweater marked with a rating badge worn on the left sleeve marked "Watchman," and front of cap marked "Watchman"

Watchmen or patrolmen shall not be required to perform any other duty while on watch

On all passenger vessels having berth or stateroom accommodations for passengers there shall be maintained while passengers are on board an efficient fire patrol so as to completely cover all parts of the vessel accessible to passengers or crew, at 20-minute intervals between the hours of 10 p m and 6 a m., except machinery spaces, occupied passenger or crew sleeping accommodations, and cargo compartments which are inaccessible to passengers or crew while the vessel is being navigated

Failure of a patrolman to follow a prescribed route, or to record each station within a definite time shall be entered on the record, along with the reason for the irregularity

The patrolman shall report to the bridge every hour on vessels where the fire patrol system is not equipped with a recording apparatus in the control stations. In vessels requiring more than one patrol route, one patrolman may contact the others and make the joint report to the bridge

A patrolman while on duty shall have no other tasks assigned to him. He shall be provided with a flashlight and shall wear a distinctive uniform or badge

In the case of vessels of nonflammable construction which are fitted with an approved automatic fire-detecting and alarm system in public spaces, the patrol throughout the entire patrolled area may be at 1-hour intervals

115.24 Flashing the rays of a searchlight or other blinding light Flashing the rays of a searchlight or other blinding light onto the bridge or into the pilot house of any vessel under way is prohibited. Any person who shall flash or cause to be flashed the rays of a blinding light in violation of the above may be proceeded against in accordance with the provisions of section 4450, R S, as amended, looking to the revocation or suspension of his license or certificate

115 25 Unauthorized lights Any master or pilot of any vessel who shall authorize or permit the carrying of any light, electric or otherwise, not required by law that in any way will interfere with distinguishing the signal lights may be proceeded against in accordance with the provisions of R S 4450, as amended, looking to a revocation or suspension of his license

115 26 Sanitation It shall be the duty of the master and chief engineer of any vessel under the jurisdiction of the Coast Guard to see that such vessel and the passengers' and crew's quarters are kept in a sanitary condition Failure on the part of the master (or chief engineer so far as it applies to the engineer's department) of any vessel to observe and carry into effect this section shall be sufficient cause for the suspension of his license on a charge of inattention to his duties

115 27 Steam vessels requiring licensed masters There shall be a duly licensed master on board every steam vessel of more than 150 gross tons, subject to the inspection laws of the United States, whenever such steamer is under way

115 32 Duties of mates of inland steamers It shall be the duty of the mate of every inland steamer carrying passengers to assign to deck or steerage passengers the space they may occupy on board during the voyage, and to supervise the stowage of freight or cargo, and see that the space set apart for passengers is not encroached upon He shall also carefully examine all marks on packages of freight delivered on board for shipment, with a view to detect and prevent any combustible or other dangerous articles prohibited by law being delivered on board One copy of this section shall be furnished every steamer to which this section applies, to be framed under glass and posted on the main deck

115 36 Tonnage of steam vessels on which pilots may act (a) The navigation of every steam vessel of more than 150 gross tons shall be under the control of a first-class pilot

(b) A first-class pilot, or a second-class pilot who has reached the age of 21 years, may act as master or pilot in charge of navigation of a steam vessel not exceeding 150 gross tons

(c) A second-class pilot is authorized to act as pilot in charge of a watch on any steam vessel within the qualifications specified in his license

115 37 Pilots governed by rules Pilots of steam vessels, while in the discharge of their duties, shall be governed by the rules of the Commandant, made for their guidance, and not by any instructions emanating from any inspector or other person

115 44 Examination of boilers and machinery by engineer It shall be the duty of an engineer when he assumes charge of the boilers and machinery of a vessel to examine the same forthwith and thoroughly, and if he finds any part thereof in bad condition, he shall immediately report the facts to the master, owner, or agent, and to the Officer in Charge, Marine Inspection, of the district, who shall thereupon investigate the matter, and if the former engineer has been wilfully negligent in the performance of his duties, he may be proceeded against under the provisions of R S 4450, as amended, looking to a suspension or revocation of his license

115 45 Reports of accidents, repairs, and unsafe boilers and machinery by engineers. Before making repairs to a boiler of a steam vessel the engineer in charge of such steamer shall report, in writing, the nature of such repairs to the Officer in Charge, Marine Inspection, of the district wherein such repairs are to be made

And it shall be the duty of all engineers when an accident occurs to the boilers or machinery in their charge tending to render the further use of such boilers or machinery unsafe until repairs are made, or when, by reason of ordinary wear, such boilers or machinery have become unsafe, to report the same to the Officer in Charge, Marine Inspection, immediately upon the arrival of the vessel at the first port reached subsequent to the accident, or after the discovery of such unsafe condition by said engineer *Provided, That, during the period when a state of war exists between the United States and any foreign nation, communications in regard to accidents shall be handled with caution, and the above-mentioned reports shall not be made by radio or by telegram*

PART 116—INSPECTION OF VESSELS

Sec		Sec	
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CROSS REFERENCE

Definition of terms See §113 01

Section 116 1 Application for inspection of vessels; exemption of vessels while laid up or dismantled The annual inspection of any vessel subject to the provisions of Title 52, Revised Statutes of the United States, shall be made only on written application, presented to the Officer in Charge, Marine Inspection, by the owner, master, or authorized agent of the vessel to be inspected. Such application shall state upon its face that previous application for inspection has not been made to any other inspector.

Vessels while laid up and dismantled and out of commission are exempted from any or all inspections required under Sections 4417, 4418, 4426, and 4427 of the Revised Statutes of the United States (46 U S C 391, 392, 404, 405).

All vessels or other floating equipment used by or in connection with any "civilian nautical school" as defined by section one of the Act of Congress approved June 12, 1940 (54 Stat 346, 46 U S C 1331) shall, whether being navigated or not, be subject to all the laws covering the inspection of passenger vessels in effect on or before June 12, 1940, and the regulations thereunder, including the inspection of hulls, the installation and inspection of machinery and boilers, lifesaving and fire-fighting equipment, construction, and the licensing of officers and manning, as more particularly set forth in full in this subchapter and Subchapters E (Load Lines) and F (Marine Engineering) of this chapter.

116 2 Vessels owned or employed by the United States Steam vessels employed by the Government, unless the titles of the same are actually vested in the United States, are not exempt from inspection.

116.3 Authority of inspectors Inspectors may lawfully inspect any vessel within their respective districts upon proper application.

116 4 Inspection of hulls In the inspection of hulls of vessels, the inspector shall carefully inspect every accessible part of the hull, and carefully examine the wood or metal of which the hull is constructed, to determine the condition of same, making all necessary hammer tests of hulls constructed of iron or steel. If the inspector shall not have satisfactory evidence otherwise of the soundness of the hull of a wooden vessel, he shall not give a certificate until the same shall be bored or opened up to his satisfaction.

All scuppers, sanitary and other similar discharges which lead through the ship's hull, shall be fitted with efficient means for preventing the ingress of water in the event of a fracture of such pipes.

The requirements of the above paragraph do not apply to the discharges in the machinery space connected with the main and auxiliary engines, pumps, etc

All scupper, soil, and sanitary pipes shall be adequately protected, casings to be substantial and so fitted to be conveniently removed for the purpose of examination

116.5 Notice to inspectors of vessel on dock, alterations Whenever any vessel is placed upon the dock for repairs it shall be the duty of the master, owner, or agent to report the same to the Officer in Charge, Marine Inspection, of that district, so that a thorough inspection may by him be made to determine what is necessary to make such vessel seaworthy if the condition or age of the vessel, in the judgment of the inspectors, renders such examination necessary

No repairs or alterations affecting the safety of the vessel, either in regard to hull or machinery, shall be made without the knowledge of the Officer in Charge, Marine Inspection. Drawings or prints of such alterations shall be furnished, in duplicate, to the Officer in Charge, Marine Inspection, having jurisdiction, one copy of which shall be forwarded to the Commandant. Notice of such repairs and changes is necessary, even if such work does not require the vessel to be placed in a drydock, and even if there are no licensed officers attached to the vessel

116.5a Gas-free certificates for repairs or alterations involving hot work On any vessel which has carried inflammable or combustible liquids in bulk, as fuel or cargo, whether in a repair yard or elsewhere, no repairs or alterations involving riveting, welding, burning, or like fire-producing operations shall be made in or on the boundaries of oil bunkers, oil tanks, oil pipe lines and heating coils until an inspection has been made to determine that such operations can be undertaken with safety. Such inspections shall be made and evidenced as follows

(a) When in a port of the United States, this inspection shall be made by a gas chemist certificated by the American Bureau of Shipping, however, if the services of such certificated gas chemist are not reasonably available, the marine inspector of the Coast Guard, upon recommendation of the vessel's owner and his contractor, or their representatives, shall select a person who, in the case of an individual vessel, shall be authorized to make the inspection. If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth that fact in writing and qualified, as may be required, shall be issued by the certificated gas chemist or the authorized person before the work is started

(b) When not in such a port and a gas chemist is not available, this inspection shall be made by the senior officer present, who shall make an entry in the log to that effect

116.6 Certificates of inspection Certificates of inspection for any period less than one year shall not be issued, but nothing herein shall be construed as preventing the revocation or suspension of certificates of inspection in case such process is authorized by law

116.6a Exhibition of certificate of inspection On vessels of over 25 gross tons, the original certificate of inspection must be framed under glass and posted in a conspicuous place in the vessel where it will be most likely to be observed by passengers and others. On vessels of not over 25 gross tons, the original certificate of inspection must be kept on board to be shown on demand

116.7 Permits to go to other ports for repairs. An Officer in Charge, Marine Inspection, issuing a permit to any vessel to proceed to other ports for repairs shall state upon the face of the same the conditions upon which it is granted and whether the vessel is to be allowed to carry freight or passengers, the quantity and number. *Provided, however,* That no vessel whose certificate had expired shall be permitted to carry passengers or freight while en route to another port for repairs

When, under R. S. 4456 (46 U. S. C. 438), vessels obtain a permit from the Officer in Charge, Marine Inspection, of a district to go from his district to another to make repairs, said Officer in Charge, Marine Inspection, shall notify the Coast Guard District Commander,

stating the repairs to be made on said vessels. The Coast Guard District Commander shall notify the Coast Guard District Commander of the district where such repairs are to be made, furnishing him a copy of the report of the inspector indicating the repairs ordered on said vessels.

116.8 Furnishing of drawings of new vessels to inspectors, marking of draft on vessel. On and after July 1, 1930, the owner or builder of every new vessel of over 100 gross tons, before making application for first inspection of the vessel, shall furnish the Officer in Charge, Marine Inspection, of the district where the vessel is to be inspected, drawings or prints, as follows: Sheer, half breadth and body plans, midship section, inboard profile, arrangement of decks and hatch details, capacities of double bottoms and fuel compartments, and such other drawings or prints showing fully the general construction of the vessel (of iron, steel, or wood), including dimensions, spacing of frames, disposition of hull plates, of outside planking and inside ceiling, details of principal scarfs, construction of transverse and longitudinal bulkheads, and location of same.

The drawings or prints and description of the vessel shall be furnished in duplicate to the Officer in Charge, Marine Inspection, making the first inspection, one copy of which shall be forwarded to the Commandant.

All vessels 50 gross tons and over, under the jurisdiction of the Coast Guard, shall have the draft of the vessel plainly and legibly marked upon the stem and upon the sternpost or rudderpost or at such other place at the stern of the vessel as may be necessary for easy observance. The draft shall be taken from the bottom of the lowest part of the keel to the surface of the water, the bottom of the mark to indicate the draft in feet.

116.9 Emergency lighting system. (a) All vessels engaged in the passenger service, which are electrically lighted by dynamos or other electric units, located below the deep-load line of the vessel, shall have on board an emergency electric lighting system located above the deep-load line to light the vessel sufficiently to enable the passengers and crew to find their way to the exits in the event of failure of the main lighting system. The emergency lighting system shall at all times be ready for immediate use, and shall be installed and arranged so that all emergency lights may be switched on from the pilothouse, navigation bridge, or a central station.

(b) On all passenger vessels contracted for on and after July 1, 1935, or where existing emergency installations operated by internal combustion engines are replaced, the emergency generator shall be driven by a Diesel or semi-Diesel engine, equipped with means for quick starting. Such emergency equipment shall be located in steel or iron compartments or rooms on the deck above the weather deck and isolated from the passenger and crew quarters. Where existing installations of emergency engines and generators are located in wooden compartments or rooms, such compartments or rooms shall be made fire-resistant by lining same with asbestos board having a thickness of not less than one-quarter inch over which iron or steel sheathing shall be fitted.

116.10 Specifications covering types of voice tubes and telephones—(a) Signals. (1) Steamers using the bell signals between the pilothouse and engine room shall have a tube, of proper size, so arranged as to return the sound of the bell signals to the pilothouse, and shall also be provided with a speaking tube or other device for the purpose of conversation between pilothouse and engine room.

(2) Voice tubes or telephone equipment installed on new or existing vessels or fitted as replacements on existing vessels to provide communication between the pilothouse and (i) the emergency steering station, (ii) the steering engine room, and (iii) the engine room, shall conform to the following requirements:

(b) **Voice tubes.** (1) Where the length of voice tube required exceeds 125 feet, or if for other reasons efficient communication cannot be obtained by a voice tube installation, telephone equipment shall be substituted.

(2) Where the length of the voice tube as installed is not over 75 feet, the tube used shall be at least 2 inches in diameter. Installations having a length of over 75 feet shall be at least 2½ inches in diameter.

(3) All voice tubes and voice tube fittings shall be of noncorrodible metal, and flexible tubes or bends shall be used in place of fittings wherever possible. Joints in tubing shall be made with white lead, and tubes shall be supported at least every 8 feet on straight leads and on bends as required.

(4) Voice tubes shall be protected where liable to injury and shall not be run in bunkers, cargo spaces, or through machinery spaces unless unavoidable, and they shall be amply protected by metal or heavy sheathing. They shall be provided at the lower end of all risers and in pockets where water can collect with suitable plugs for draining. Flexible terminal tubes, where used, shall have an entire metal inner surface. Voice tubes should be fitted with elliptical belled mouthpieces with hinged covers, with a whistle indicator on the side of the mouthpiece. All voice tubes shall be provided with designating name plates. Telephone equipment may in all cases be installed in lieu of voice tubes.

(c) Telephone systems (1) All telephone transmitters and receivers shall be of sound-powered type designed especially for marine use. The Commandant shall approve and list equipment which, if properly installed, will meet the requirements set forth herein. The type number and model shall be plainly stamped on the equipment.

(2) A call signal shall be provided at each telephone station. This signal may be a bell or other sound device which provides a distinctive signal throughout the space where the telephone is installed. At installations which are protected by watertight boxes, all signals shall be of such character as to comply with the above when the box is closed. Ringers, if located outside the box, must be of watertight construction. Installations on new and existing vessels shall be provided with call signals which are actuated by the operation of a magneto generator at the calling station, except that sound-powered replacements of battery operated telephone equipment on existing vessels may be provided with battery operated call signals. In all cases the calling circuit shall allow any one station to call any other station individually.

(3) At each telephone installation a suitable hanger for the handset shall be provided. It shall be constructed in such a way as to hold the handset firmly in place and away from the bulkhead. The handset shall not be dislodged from the hanger by the motion of the ship or by a severe shock near the mounting.

(4) Telephones installed at external locations exposed to the weather or in locations subject to severe moisture conditions shall be housed in a substantial, watertight metal enclosure. The cover shall be hinged at the bottom or side of the box, and when closed, shall be fastened by a simple substantial mechanism which, when operated, exerts sufficient pressure to make the enclosure watertight. The gasket shall be fastened to, and inserted in, the edge of the box or cover. The magneto generator and switches shall be of watertight construction. The generator and all switches shall be installed inside of the enclosure.

(5) At other locations where a watertight box is not required, the telephone equipment shall be of splashproof construction and shall be so installed as to minimize possibility of damage by external means. In engine rooms a booth or other suitable auxiliary equipment shall be provided, if necessary, in order that a telephone conversation can be carried on while vessel is being navigated.

(6) The system shall be installed independent from any other systems of communication or of wiring, but may be extended to cover any other locations which are necessary or desirable. Telephone cable shall be of a type suitable for marine use and shall be run as close to the fore and aft center line of the vessel as possible, and protected from external damage. On passenger vessels where telephone cable must, due to the vessel's construction, run closer than one-fifth of the beam to the side, port and starboard cables shall be provided

and connected in parallel. It shall be so installed as to minimize ingress of water and dampness.

(7) The talking circuit shall be electrically independent of the calling circuit. A short or open circuit or a ground on either side of the calling circuit shall not affect the talking circuit in any way.

(d) **Telegraph.** Nothing in this section shall be construed to prevent the use of the so-called telegraph now in use for conveying signals from the pilothouse to the engine room, but in all cases where the telegraph is used the signal shall be repeated back.

(e) ¹

(f) **Electrical engine order telegraph systems.** All electrical engine order telegraph systems on vessels, not also equipped with mechanical telegraphs, shall be provided with an alarm, located on the bridge, to indicate visually and audibly the failure of power to the system.

(g) **Engine-room signals.** Signals between engine room and pilothouse, whether they be telegraph, bell, whistle, telephone, or voice tubes, shall be examined and tested at each inspection.

116.11 Whistles. Inspected motor vessels shall be provided with an efficient whistle sounded by steam or by some substitute for steam to give the necessary whistle signals.

116.12 Alarm bells—(a) New vessels. All vessels over 100 gross tons the construction of which is begun on and after September 1, 1943, shall have all sleeping accommodations, public spaces, and machinery spaces equipped with a sufficient number of alarm bells so located as to warn all occupants. The system shall operate from a continuous source of electric energy capable of supplying the system for a period of at least 8 hours without being dependent upon the main, auxiliary or emergency generating plants. Each bell shall produce a signal of a tone distinct from that of other bell signals in the vicinity and shall be independently fused with each of these fuses located above the bulkhead deck. The bells shall be controlled by a manually operated contact maker located in the pilothouse, or, if specific approval is given by the Commandant, in the fire control station. The characteristics of the contact maker shall be such that it possesses

(1) Positive contact

(2) Watertightness (when located in open spaces subject to weather)

(3) Means whereby its electrically open or closed position can be determined by sense of touch

(4) Means to effect a make-and-break circuit for signaling

(5) Self-maintaining contacts.

(b) **Existing vessels.** All existing vessels over 100 gross tons and such vessels the construction of which is begun prior to September 1, 1943, shall have all sleeping accommodations equipped with a sufficient number of alarm bells so located as to warn all the occupants. The alarm bells, if electric, shall be operated from an open switch from the pilothouse or bridge. The bells shall be of such size, character, and construction, as to provide an alarm throughout the spaces for which they are provided.

116.13 Fog bells. The efficient fog bell required upon vessels by law (sec 1, 26 Stat 325, as amended, 33 U S C 91) shall be held to mean a bell not less than 8 inches in diameter from outside to outside and constructed of bronze or brass or other material equal thereto in tone and volume of sound, and located where the sound shall be the least obstructed.

116.16 Electrical installations. On all vessels contracted for after June 30, 1928, using electricity for any purpose, the installation shall be in keeping with the best modern practice.

¹ Reserved for future use.

Wires shall be armored or run in approved metal conduits. Metal conduit or armored casing shall be required in bunkers, cargo spaces, storerooms, etc., and in all places where the leads are liable to mechanical injury. Joints in wiring shall be avoided as far as possible in the above-named spaces, and where joints are necessary they shall be made in metal boxes, readily accessible and protected in the same manner as the leads.

When wires are led through beams, frames, or nonwatertight bulkheads, they shall be carried either in metal conduits, armored casing, or protected by hard rubber, or other equivalent bushings.

When wires are carried through watertight decks or bulkheads, they shall be provided with a suitable stuffing box at deck or bulkhead. Where such points are liable to mechanical injury, they shall be protected by suitable boxes or cages.

In locating the wiring system as a whole, care shall be taken to provide accessibility for examination and repair. Special care shall be taken to avoid any arrangement which might permit the lodgment of standing water, and when necessary, openings in conduits or drains shall be installed to accomplish this purpose.

All fixtures, taps, joints, and splices shall be fitted with metal boxes. Boxes in cargo and machinery spaces, galley, and those exposed to weather shall be watertight.

Splices shall be so joined as to be both mechanically and electrically secure without solder. They shall then be soldered and properly insulated and further protected by waterproof tape.

Changes or alterations in the electrical installations of vessels now in service shall be in accordance with this rule.

Special attention shall be given by the inspectors in the examination of present installation to see that it is of such nature as to preclude any danger of fire, giving particular attention to wiring which is carried through wooden bulkheads, partitions, etc.

The type of electrical equipment and the types of electric cables to be used in the various parts of vessels constructed after July 1, 1937, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A. I. E. E. Standards No 45, October 1930, as published by The American Institute of Electrical Engineers.

The type of electrical equipment and the types of electric cables to be used in the various parts of all vessels constructed after January 1, 1939, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A. I. E. E. Standards No 45, December 1938, as published by The American Institute of Electrical Engineers.

The type of electrical equipment and the types of electric cables to be used in the various parts of all vessels, the contract for the construction of which is signed after June 1, 1941, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A. I. E. E. Standards No 45, July 1940, as published by The American Institute of Electrical Engineers.

The electrical installation on all existing vessels shall be maintained in good electrical and mechanical condition at all times. Minor replacements of cable and equipment may be made with the same type that was permitted by the regulations at the time the vessel was constructed. Major alterations or major extensions to the electrical installation on existing vessels shall be made in accordance with the rules of this section for new vessels as of the date the contract is made for such alterations or extensions.

For vessels the contract for the construction of which was signed prior to September 2, 1945, the specification covering electrical installations titled "United States Coast Guard, Merchant Marine Inspection, Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945,¹ is, during the Unlimited National Emergency,

¹ A copy of the specifications is on file in the office of the Federal Register, and copies may be obtained upon request from the Commandant (MMT), United States Coast Guard Headquarters, Washington 25, D. C., or any Coast Guard District Commander.

applicable as alternative provisions to those contained in the foregoing parts of this section. For vessels the contract for the construction of which is signed on and after September 2, 1945, those parts of the specification covering electrical installations titled "United States Coast Guard Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945, specified in paragraphs 1, 4, and 5 thereof relating to electric cable are, during the Unlimited National Emergency, applicable as alternative provisions to those contained in the foregoing parts of this section.

116 17 Use of approved equipment. (a) No lifeboat, lifeboat-disengaging apparatus, life raft, life preserver, fire extinguisher, fire-extinguishing apparatus, or other equipment required to be approved by Title 52, Revised Statutes, shall be used on any vessel inspected and certificated by the Coast Guard which shall not first be approved by the Commandant.

(b) Boilers, pressure vessels, machinery, piping, electrical and other installations, including lifesaving, fire-fighting, and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (sec 501, 56 Stat. 180, 50 App Sup, 635), which do not fully meet the detailed requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended. In each instance prior to final action by the Commandant, the Officer in Charge, Marine Inspection, shall notify Headquarters of the facts in the case, together with recommendations relative to suitability for retention.

116 17a Repairs to fire-fighting and lifesaving apparatus. No repairs or alterations, except in emergency, shall be made to any lifeboat, lifeboat-disengaging apparatus, life raft, life preserver, fire-extinguishing apparatus, or other appliance subject to inspection, without advance notice to the Officer in Charge, Marine Inspection. Such repairs or alterations shall so far as is practicable be made with materials and tested in the manner specified within this part for new construction. Emergency repairs or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, in the district where the vessel may call after such repairs are made, nor shall any lifeboat or life raft be reconditioned or used on a steamer other than that for which it was built, without notice to and supervision by the Officer in Charge, Marine Inspection, in the district wherein such reconditioning or repairs are to be made.

116 18 Standard in inspection of hulls, boilers and machinery. In the inspection of hulls, boilers, and machinery of vessels, the rules promulgated by the American Bureau of Shipping respecting material and construction of hulls, boilers, and machinery, and the certificate of classification referring thereto, except where otherwise provided for by the rules and regulations in this subchapter, Subchapter E (Load Lines), or Subchapter F (Marine Engineering), shall be accepted as standard by the inspectors.

116 19 Copies of specifications and/or blueprints. Sixty copies of all blueprints and/or specifications of every article approved after July 1, 1927, for use on vessels subject to inspection shall be supplied to the Commandant for the use of inspectors.

116 19a Passenger accommodations for ferryboats. Ferryboats subject to inspection under Title 52, Revised Statutes, permitted to carry 200 or less passengers shall have at least one toilet and one washbasin for men and one toilet and one washbasin for women located in so-called toilet rooms, in, or adjacent to, passenger quarters.

Such vessels permitted to carry over 200 and not over 500 passengers shall have at least one toilet, one urinal, and one washbasin for men and two toilets and one washbasin for women.

For every additional 500 passengers permitted to be carried there shall be one additional toilet or urinal for men and one additional toilet for women.

Washbasins to be added in proportion to one additional for every two additional toilets or urinals in the men's room and every two additional toilets in the women's room

The above is applicable to new vessels, also to existing vessels when reasonable and practicable

116 19b Crew accommodations. On all vessels of 100 gross tons and over, the contract for the construction of which is signed after January 1, 1941, there shall be provided at least one toilet, one washbasin, and one shower or bathtub, for each eight members, or portion thereof, in the crew to be accommodated. The crew to be accommodated shall include all members who do not occupy rooms to which private facilities are attached

When the engine room crew, exclusive of licensed officers and others separately provided for, exceeds eight, their toilet and wash room equipment shall be separate from the other crew members. When the stewards' department crew, exclusive of those separately provided for, exceeds eight, their toilet and wash room equipment shall be separate from the other crew members. Separate facilities shall also be provided for the female members of the crew

All washbasins, showers, and bathtubs shall be equipped with proper plumbing, including hot and cold running water. Washbasins may be located in the crew sleeping quarters, if properly installed and equipped with proper plumbing. The wash rooms and toilet rooms shall be equipped with proper drains

The toilet rooms shall be separate from the wash rooms and at least one washbasin shall be fitted in each toilet room. All toilets shall be installed with proper plumbing for flushing. Where more than one toilet is located in a space or compartment, each toilet shall be separated by partitions, which shall be open at the top and bottom for ventilation and cleaning purposes. Toilets shall be provided with seats of the open front type that automatically lift up when not in use. Urinals may be fitted in toilet rooms, if desired, but no reduction in the required number of toilets will be made therefor

When the total number of the crew exceeds 100, consideration may be given to special arrangements and to a reduction in number of facilities required

On all vessels of 100 gross tons and over, the contracts for the construction of which were signed on or prior to January 1, 1941, the toilet and washing facilities shall be in keeping with the age, size and service of the vessel and consistent with the principles underlying the requirements for vessels the contracts for the construction of which were signed after January 1, 1941, when reasonable and practicable a minimum of one toilet, one washbasin, and one shower or bathtub for each ten members, or portion thereof, in the crew to be accommodated, shall be provided. On such vessels separate washing facilities are not required where the engine room crew, exclusive of licensed officers and others separately provided for, does not exceed ten

116.19c Passenger accommodations for excursion boats and passenger barges Excursion boats and passenger barges, permitted to carry 100 or less passengers shall have at least one toilet and one washbasin for men, and one toilet and one washbasin for women, located in so-called toilet rooms, in, or adjacent to, passenger quarters

Such vessels permitted to carry over 100 and not over 300 passengers shall have at least two toilets and one washbasin for men, and two toilets and one washbasin for women. Such vessels permitted to carry over 300 and not over 500 passengers shall have at least three toilets and two washbasins for men, and three toilets and two washbasins for women

For every additional 500 passengers permitted to be carried on such vessels, there shall be at least one additional toilet for men and one additional toilet for women.

Washbasins to be added in proportion to one additional basin for every two additional toilets or urinals in the men's room and one additional basin for every two additional toilets in the women's room

All toilet and washing equipment shall be fitted with running water

Urinals may be substituted for toilets required in the men's department *Provided*, That at least one-half of the toilet equipment required in the men's department are toilets.

Private bath and toilet equipment rented with individual rooms to passengers shall not be considered a part of the required equipment within the meaning of this rule

Vessels carrying passengers shall have separate toilets and washbasins for crew, located separately from passengers' toilet and washroom equipment space

Where passenger barges are towed alongside, the toilet and washbasin equipment required may be on the towing vessel, provided passengers may pass to and from the towing vessel with safety

The above is applicable to new vessels, also to existing vessels when reasonable and practicable

PART 117—FERRYBOATS

Sec	Sec
117 1 Navigation limits	117 7 Automobiles or other motor vehicles carried on ferryboats
117 2 Bulkheads	
117 3 Lifesaving equipment	CROSS REFERENCE
117 4 Life preservers, life floats, and fire-fighting equipment	Fire prevention, fire apparatus See part 114
117 5 Lifesaving and fire-fighting equipment of car-ferry steamers	Definition of terms See § 113 01
117 6 Duty of master of car-ferry steamer	Passenger accommodations for ferryboats: See § 116 19a

Section 117 1 Navigation limits The navigation of ferryboats shall be confined to the ferry routes specified in the certificate of inspection, but such vessels may be permitted to go beyond their authorized routes with passengers only, or, without such permit, to lighten or relieve vessels in distress. When any ferryboat leaves her ferry route and carries passengers, she shall be required to carry the same officers, crew, and equipment as required of other steamers carrying passengers.

117.2 Bulkheads. Every new mechanically propelled ferry vessel carrying passengers for hire shall have a sufficient number of transverse watertight bulkheads so that the vessel will remain afloat and have positive stability in the event any one main compartment is flooded.

A forepeak or collision bulkhead shall be fitted and located not less than 5 percent of the length of the ship, and not more than 10 feet plus 5 percent of the length of the ship from the bow, at load water line.

One bulkhead shall be fitted at the forward end of the machinery space (which includes boiler space) and one bulkhead shall be fitted at the after end of the machinery space. Other transverse bulkheads shall be so located as to meet the above requirements of subdivision and stability.

Main transverse bulkheads shall not be stepped, but may be recessed. No recess shall be fitted nearer the vessel's side than one-fifth of the vessel's beam amidships measured at right angles to the center line at the level of the load water line on which the subdivision is based. Bulkheads shall extend to a deck whose distance above the load water line is sufficient to enable the subdivision and stability requirements to be met with a fair margin of safety.

If the distance between two adjacent main transverse watertight bulkheads is less than 10 feet plus 2 percent of the vessel's load water line, only one of these bulkheads shall be regarded as forming a boundary of a main compartment.

In lieu of bulkheading, the Commandant will allow alternative arrangements wherein sufficient buoyancy is supplied by independent air tanks or other means, to float the vessel when flooded while fully loaded. Such arrangements must be approved by the Commandant in each instance.

Existing mechanically propelled ferry vessels carrying passengers for hire shall comply with the above requirements for new vessels unless it can be shown by the owner to the satisfaction of the Commandant that the application of the requirements is impracticable and unreasonable. (Where the length of trip between terminals is 10 minutes or less, the last paragraph is effective January 1, 1940.)

117 3 Lifesaving equipment. All ferryboats of 50 gross tons or over shall be equipped with such lifeboats, life rafts, outside ladders, and other means of escape, in case of disaster, as, in the opinion of the inspectors, shall meet the requirements of each particular case.

But in no case shall the cubic feet of boat capacity be less than that provided in the table following

	Cubic feet
Ferryboats of 50 and not over 300 gross tons.....	120
Ferryboats over 300 and not over 600 gross tons.....	240
Ferryboats over 600 gross tons.....	360

Provided, That on ferryboats of more than 300 gross tons one-half the boat capacity required may be substituted by its equivalent in approved life rafts

Ferryboats of less than 50 gross tons shall be equipped with boats or rafts as in the opinion of the inspectors may be necessary in case of disaster to secure the safety of all persons on board

117 4 Life preservers, life floats, and fire-fighting equipment. After July 1, 1929, all ferryboats shall be equipped with a life preserver (or float where same is allowed by law) for every 5 square feet of passenger deck surface on single-deck ferryboats and for every 8 5 square feet of such deck surface on ferryboats having more than one passenger deck, such measurement to include all deck space in the team gangways at each end of the cabins *Provided, however*, That ferryboats navigating on routes where the number of passengers carried is less than the number of life preservers required by this measurement shall be required to carry one life preserver for each person on board

All life preservers or floats shall be distributed in the most accessible places, where they can be reached at all times, and it shall be the duty of the Officer in Charge, Marine Inspection, to see that all the life preservers or floats are marked with the name of the vessel

All ferryboats shall be provided with the same fire apparatus required on passenger vessels of equal tonnage, except that a fire-detecting and alarm system need not be installed, but a manual sprinkler system shall be installed to blanket the vehicle spaces on all 2-decked ferryboats

117 5 Lifesaving and fire-fighting equipment of car-ferry steamers. All car-ferry steamers transporting passengers in cars shall carry the same lifesaving and fire-fighting equipment as required on ferryboats, excepting that the number of life preservers, or wooden floats where the same are allowed by law, shall equal the number of persons carried

117 6 Duty of master of car-ferry steamer It shall be the duty of the master of any such car-ferry steamer to see that all of the doors of the cars are unlocked and that the vestibules of the cars are open while the cars are on the steamer, to allow the persons so carried free egress at all times

117 7 Automobiles or other motor vehicles carried on ferryboats (a) Automobiles or other motor vehicles shall be stowed in such a manner as to permit both passengers and operators to get out and away from them freely in the event of fire or other disaster Where there is insufficient clearance to provide for easy egress or ingress at all times, both passengers and operators shall be directed to leave their vehicles and to occupy other spaces reserved for them during the crossing The decks, where necessary, shall be definitely marked with painted lines to indicate the vehicle runways and the aisle spaces

(b) The master shall take all necessary precautions to see that automobiles or other motor vehicles have their motors turned off when the ferryboat is under way and the motors shall not be started until the ferryboat is secured to the ferry landing

(c) The master shall have appropriate "no smoking" signs posted and shall take all necessary precautions to prevent smoking or carrying of lighted or smoldering cigars, cigarettes, etc., in deck areas assigned to automobiles or other motor vehicles.

PART 118—EXCURSION STEAMERS

Sec
118 1 Permits to engage in excursions

Sec
118 2 Additional life preservers required

CROSS REFERENCE

Definition of terms See § 118 01

Fire prevention, fire apparatus See part 114

Passenger accommodations for excursion boats See § 116 19c

Section 118 1 Permits to engage in excursions If the master, agent, or owner of any passenger or ferry steamer desires a permit to engage in excursions, the inspectors, upon the written application of such a master, agent, or owner, may issue the same, stating the number of extra passengers the boat may carry with safety, the route she may run, and the kind and extra number of lifesaving appliances with which she is provided. The permit, when used, shall be framed under glass and exposed to the view of the passengers, in connection with the certificate of inspection.

Increases in the passenger allowance of any vessel, whether specified in regular certificate or by excursion permit, may be allowed only after personal inspection of the vessel by the Officer in Charge, Marine Inspection, or by the Coast Guard District Commander if he grants the increase, who shall be satisfied that the vessel and her equipment justify the additional allowance, and of which inspection a written record shall be made and kept in the files of the office granting the allowance and a copy thereof forwarded to the office of the Commandant.

118 2 Additional life preservers required Passenger steamers making excursions on rivers shall have, in addition to their regular lifesaving equipments, a life preserver made in accordance with the rules of the Commandant, or their equivalent in other approved lifesaving appliances, for each additional passenger allowed.

PART 119—BARGES

See		See	
119 1	Lifesaving and fire-fighting equipment of open barges carrying passengers	119 4	Equipment of car-carrying barges duty of master
119 2	Lifesaving and fire-fighting equipment of closed barges	119 5	Fire extinguishers on barges carrying passengers
119 3	Lifesaving and fire-fighting equipment of barges engaged in excursions	119 6	Railing for open barges

CROSS REFERENCE

Definition of terms See § 113 01

Fire prevention, fire apparatus See part 114

Passenger accommodations for passenger barges See § 116 19c

Section 119 1 Lifesaving and fire-fighting equipment of open barges carrying passengers Any open or uncovered barge carrying passengers while in tow of any steamer shall carry one life preserver or one float for every person carried, two axes, and a yawl boat or boats of a capacity in the same proportion to the number of persons carried as is required for lifeboats on steamers carrying passengers

119 2 Lifesaving and fire-fighting equipment of closed barges Covered barges or barges with inclosed deck or decks shall carry the same equipment as required by § 119 1, except that they shall carry three axes

119 3 Lifesaving and fire-fighting equipment of barges engaged in excursions Every barge carrying passengers in tow of any steamer and engaged in excursions shall be supplied with one life preserver or one float for every person carried on board, and shall be equipped with three axes, and two yawl boats of not less than 60 cubic feet capacity each, to be carried on deck ready to be launched for immediate use, or towed in such manner as to best afford prompt relief in case of accident or disaster

119 4 Equipment of car-carrying barges, duty of master Any barge in tow of a steamer and used for transporting passengers in cars shall be equipped in accordance with this part, and the master or person in charge of the barge or the master of the towing steamer shall see that all of the doors of the cars are unlocked and that the vestibules of the cars are open while the cars are on the barge, to allow the persons so carried free egress at all times

119 5 Fire extinguishers on barges carrying passengers Every barge carrying passengers while in tow of a steamer shall be equipped with portable fire extinguishers in the same manner as required for passenger steam vessels of the same type and length

119 6 Railing for open barges All open barges carrying passengers shall be inclosed by a good and substantial rail not less than 3 feet high

PART 120—DUTIES OF INSPECTORS

Sec.		Sec.	
120 1	Publication of inspectors' reports	120 9	Testing of boilers and hose
120 2	Reports of Coast Guard District Commanders and Officers in Charge, Marine Inspection	120 10	Reports of accidents
120 3	Requests for testimony	120 12	Carrying of excess steam
120 4	Inspection of boilers	120 14	Guards and rails
120 5	Inspection of steam pipes	120 15	Inclining tests
120 6	Entrance of boilers by inspectors	120 16	Inspection of airports and deadlights
120 7	Location of whistles on floating structures	120 17	Inspection of lifeboat-disengaging apparatus
120 8	Location of steam whistles	120 21	Fire prevention inspection
		120 22	Inspection of quarters

CROSS REFERENCE

Definition of terms See § 113 01

Section 120 1 Publication of inspectors' reports. Annual reports shall not be made public until after they have been printed and made public by the Coast Guard. No inspector or clerk shall make public any report without the consent of the Coast Guard District Commander or the Commandant of the Coast Guard.

120.2 Reports of Coast Guard District Commanders and Officers in Charge, Marine Inspection (a) It shall be the duty of the Coast Guard District Commanders to inform in writing their respective Officers in Charge, Marine Inspection, of their decisions in cases of appeals.

(b) A Coast Guard District Commander who grants a license to a vessel engaged in towing to carry persons in addition to its crew, under the Act approved February 23, 1901 (31 Stat. L. 800, 46 U. S. C. 458, 459), shall notify the Officer in Charge, Marine Inspection, in whose jurisdiction the vessel is to operate, who shall keep a record of the same.

(c) The Officer in Charge, Marine Inspection, shall notify, through his Coast Guard District Commander, the Officers in Charge, Marine Inspection, of adjoining districts of all revocations or suspensions of licenses, the names of all persons from whom licenses have been withheld, the names of all steam vessels neglecting or refusing to make repairs when ordered, and the names of all vessels that have been refused certificates of inspections with the reasons therefor.

120 3 Requests for testimony Whenever any inspector shall find it necessary, in conducting his investigations or in the performance of any of his duties, to obtain testimony from the inspectors of other districts, he shall request the same through the Coast Guard District Commander.

120 4 Inspection of boilers. Inspectors, at their annual inspections of steam boilers, may cause to be removed from the surface of such boilers as are covered so much of said covering as may be necessary to enable them to examine parts of the boilers which cannot be properly examined from the inside, and shall examine in a thorough and careful manner, when practicable, either externally or internally, all parts of the shell of every boiler, and the masters, engineers, and owners of every steam vessel shall afford every facility necessary to carry out in the most effective and efficient manner the provisions of this section, and in no case shall an intermediate inspection be deemed any part of the regular annual inspection.

120.5 Inspection of steam pipes. It shall be the duty of inspectors when inspecting or reinspectng a vessel to carefully examine all steam pipes passing through woodwork, and if in their judgment the same are deemed unsafe they shall have them provided with air space and fitted with metal collars.

120 6 Entrance of boilers by inspectors It shall be the duty of the inspector who inspects the boilers of any steamer to actually enter the boiler or boilers where it is possible to do so, and to thoroughly examine the interior of all such boilers to see that the braces are in place and of proper size, and to determine whether the boilers are in good condition, before granting a certificate of inspection, such examination to be made after the hydrostatic pressure has been applied. A record shall be made in the inspector's report of inspection showing whether or not the inspector did actually enter the boiler, and if he did not enter the boiler, he shall give his reasons for not entering it.

120 7 Location of whistles on floating structures It shall also be the duty of the inspectors to compel all floating structures, such as steam elevators (propelled by their own motive power), to have their whistles located on the front side of such superstructures having an elevation higher than the pilothouse of the vessels.

120 8 Location of steam whistles. All steam whistles shall be placed not less than 6 feet above the top of the pilothouse of steam vessels where the height of the smokestack will admit the attachment of same below its top, when not hinged for passing under bridges, except upon steamers navigating the Red River of the North, Yukon and similar rivers, and rivers whose waters flow into the Gulf of Mexico, and steamers of less than 100 gross tons, whose steam whistles shall be placed not less than 2 feet above the tops of their pilot-houses, and all double-end ferry steamers, and steamers similarly constructed, shall have a steam whistle both fore and aft of the smokestack, or one steam whistle on either the starboard or port side of the smokestack, so that the steam, when whistle is blown, can be seen from either end of steamer, and it shall be the duty of inspectors to enforce this section at the annual inspection.

120.9 Testing of boilers and hose. It shall be the duty of the inspectors to be present when the boiler is being tested by hydrostatic pressure, and the inspectors shall observe and note the indication upon the gage.

It shall also be the duty of the inspectors to examine all pumps, hose, and other fire apparatus and to see that the hose is subjected to a pressure of 100 pounds to the square inch, and that the hose couplings are securely fastened in accordance with Part 114 of this chapter.

120 10 Reports of accidents Officers in Charge, Marine Inspection, shall report forthwith to their Coast Guard District Commanders in detail all accidents of a serious character—such as collisions, foundering, sinkings, fires—and all other casualties of interest to or affecting the Coast Guard in their respective districts.

120 12 Carrying of excess steam When it is known or comes to the knowledge of the Officer in Charge, Marine Inspection, that any steam vessel is or has been carrying an excess of steam beyond that which is allowed by her certificate of inspection, the Officer in Charge, Marine Inspection, in whose district said steamer is being navigated, in addition to reporting the fact to the United States district attorney for prosecution under R. S. 4437 (46 U. S. C. 413), shall require the owner or owners of said steamer to place on the boiler of said steamer a lock-up safety valve that will prevent the carrying of an excess of steam and shall be under the control of said Officer in Charge, Marine Inspection.

On the placing of a lock-up safety valve upon any boiler, it shall be the duty of the engineer in charge of same to blow or cause the said valve to blow off steam at least once in each watch of 6 hours or less, to determine whether the valve is in working order, and it shall be the duty of the master of such vessel to see that this section is observed, and it shall be the duty of the master and engineer to report to the Officer in Charge, Marine Inspection, any failure of such valve to operate.

In case no such report is made and a safety valve is found that has been tampered with or out of order, the engineer in charge of such boiler and the master of such vessel shall be proceeded against in accordance with the provisions of R S 4450, as amended (46 U S C 239), looking to a suspension or revocation of their licenses ¹

It shall be the duty of the Officer in Charge, Marine Inspection, to send a copy of this section to every steamer in his district when said copies are furnished by Headquarters

12014 Guards and rails (a) It shall be the duty of the inspectors when inspecting or reinspectng a vessel to see that all exposed and dangerous places, such as gears and machinery, are properly protected with covers, guards, or rails, in order that the danger of accidents may be minimized, and on vessels equipped with radio (wireless) the lead-ins shall be efficiently incased or insulated to insure the protection of persons from accidental shock. Such lead-ins shall be located so as not to interfere with the launching of lifeboats and life rafts

(b) Effective for new construction outboard rails on passenger decks shall be in at least three courses, including the top, and shall be at least 42 inches high. Inboard rails on passenger decks and all rails on crew decks shall be in at least two courses, including the top, and shall be at least 36 inches high.

12015 Inclining tests When inspectors have any reason to question the stability of any vessel under their jurisdiction, they shall require the owners of the vessel to make inclining tests on such vessel, under the supervision of the Commandant

Every passenger or ferry vessel of 500 gross tons or over, propelled by machinery, and every passenger or ferry vessel intended to carry 50 or more passengers, in either case when making application for first inspection to carry passengers, shall be subjected to an inclining test conducted under the supervision of the Commandant of the Coast Guard, and the results of the test shall be approved before the vessel shall be certificated

The owner or builder of every vessel described in the second paragraph of this section shall, as soon as possible, furnish the Officer in Charge, Marine Inspection, of the district where the vessel is to be inspected drawings or blueprints, as follows: Sheer, half breadth and body plans, midship section, inboard profile, floors, framing, bulkheads, arrangement of decks and quarters, general arrangement and location of boilers and machinery, plan and elevation, plan and elevation sections through holds, tanks, bunkers, double bottoms, and compartments, capacity plan of the bunkers, tanks, holds, double bottoms, and compartments, and the following curves: Displacement, vertical center of buoyancy, transverse metacenter, longitudinal center of buoyancy, longitudinal metacenter, center of gravity of water planes from either perpendicular, moment to alter trim, and tons per inch, except for double-end ferryboats, then the drawing or blueprint of curves will only be required to show the displacement, vertical center of buoyancy, transverse metacenter, and tons per inch. The drawings and blueprints required by this paragraph shall be forwarded, upon receipt of same, by the Officer in Charge, Marine Inspection, to Headquarters

Where vessels are required to carry fixed ballast, in order to increase the metacentric height, such ballast shall not be moved except for examination and repair of vessel, and then only in the presence of an inspector

The Officer in Charge, Marine Inspection, shall place a notation in regard to the inclining data on the upper right-hand corner of the certificate of inspection of every vessel subject to this section, to read as follows: Data relating to the stability of this vessel is on file at Coast Guard Headquarters, Washington, D C

¹ Attention is called to R S 4437 (46 U S C 413), which makes the obstructing of a safety valve a misdemeanor subject to a \$200 fine and imprisonment for not to exceed five years

It shall also be the duty of the Officer in Charge, Marine Inspection, to furnish the master and owner of every vessel under the jurisdiction of the Coast Guard and upon which the question of stability has been determined by Headquarters, a copy of the letter from Headquarters giving the result of the inclining test or investigation of the stability of the vessel. The Officer in Charge, Marine Inspection, shall require the master of every such vessel to frame this letter under glass and post it in the pilothouse.

120 16 Inspection of airports and deadlights It shall be the duty of the inspectors when inspecting or reinspectng vessels to carefully examine all airports and deadlights in the hull, and to satisfy themselves that the same are safe.

120 17 Inspection of lifeboat-disengaging apparatus It shall be the duty of the inspectors when inspecting or reinspectng vessels to carefully examine the lifeboat-disengaging apparatus and the blocks and falls thereof and to satisfy themselves that the same are in good condition, and, further, that they shall indicate in Form 840-A at annual inspection the name and record of all lifeboat-disengaging apparatus found, and, if unable to identify such lifeboat-disengaging apparatus by name, they shall within a reasonable time take the matter up with the Coast Guard District Commander in order that such apparatus may be traced for identification and approval record.

120 21 Fire-prevention inspection. (a) When inspecting oil-burning vessels, either internal-combustion type or steam-driven type, the inspector shall examine the tank tops and bilges in the fireroom and engine room to see that there is no accumulation of oil which might create a fire hazard.

(b) The examination of the fire-fighting equipment shall be made by inspectors. This applies to fire pumps, hose, chemical fire extinguishers, axes, and steam or gas smothering lines to cargo holds and compartments.

(c) The inspectors shall examine the fire-fighting equipment provided for the fireroom and engine room to ascertain if it conforms to the regulations in this subchapter and that it is in good condition for immediate use.

(d) At the annual inspection or periodical reinspectngs, the inspectors shall examine the water-sprinkling system, when fitted, to ascertain if it is in good condition and ready for immediate use.

120.22 Inspection of quarters It shall be the duty of the inspector to examine passengers' and crews' quarters to see that they are kept in a sanitary condition and to report any deficiencies.

COAST GUARD DISTRICT COMMANDERS AND MERCHANT MARINE ACTIVITIES

District	Title	City	State	Address
1st	Commander 1st Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do	Boston do do Portland Providence	Massachusetts do do Rhode Island	1400 Customhouse 1390 Customhouse 447 Commercial St 78 Pearl St 409 Federal Bldg
2d	Commander 2d Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do do do	St. Louis do do Cairo Dubuque Cincinnati Louisville Memphis Nashville Pittsburgh Point Pleasant	Missouri do do Illinois Iowa Ohio Kentucky Tennessee do Pennsylvania West Virginia	232 Old Customhouse 210 Old Customhouse 216 Old Customhouse 425-427 New Post Office Bldg 301 Post Office and Courthouse 748 Federal Bldg 606 Federal Bldg 122 Customhouse 1018 Stahlman Bldg 1215 Park Bldg Post Office Bldg
3d	Commander 3d Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do	New York do do New London New Haven Albany Philadelphia	New York do do Connecticut do New York Pennsylvania	42 Broadway do do 302 New Post Office Bldg 311 Federal Bldg 313 Federal Bldg 501 Customhouse 2d and Chestnut Sts
5th	Commander, 5th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do	Norfolk do do Baltimore	Virginia do do Maryland	Box 540, New Post Office Bldg do 204 Customhouse 206 Chamber of Commerce Bldg
7th	Commander, 7th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do do	Miami do do Tampa Charleston Savannah Jacksonville San Juan	Florida do do do South Carolina Georgia Florida Puerto Rico	Box 378 Coconut Grove Station 500 Professional Bldg 501 Professional Bldg 406 Federal Bldg 32 Customhouse 205 Customhouse 210 Federal Bldg Federal Bldg
8th	Commander 8th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do	New Orleans do do Mobile Port Arthur Galveston Corpus Christi Houston	Louisiana do do Alabama Texas do do do	352 1/2 Customhouse 813 Customhouse 311 Customhouse 505 Courthouse and Customhouse 410 Bleistein Bldg 232 Customhouse 910 Jones Bldg 810 Appraisers Store Bldg
9th	Commander 9th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do do do do do	Cleveland do do Buffalo Oswego Detroit Duluth Toledo Saint Ignace Chicago Ludington Milwaukee	Ohio do do New York do Michigan Minnesota Ohio Michigan Illinois Michigan Wisconsin	1700 Keith Bldg do 1000 Keith Bldg 440 Federal Bldg 205 Federal Bldg 430 Federal Bldg 311 Federal Bldg 402 Courthouse and Customhouse Municipal Bldg Customhouse, 610 Canal St National Bank of Ludington 533 Federal Bldg
11th	Commander 11th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do	Long Beach do do	California do do	707 Times Bldg 1105 Times Bldg do
12th	Commander, 12th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do	San Francisco do do	California do do	941-K U S Appraisers Bldg 907 U S Appraisers Bldg 227 U S Appraisers Bldg
13th	Commander, 13th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do	Seattle do do Portland Ketchikan	Washington do do Oregon Alaska	New World Life Bldg do do 1405 Felling Bldg Federal Bldg
14th	Commander, 14th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do	Honolulu do do	Territory of Hawaii do do	210 Federal Bldg do P O Box 4010

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TREASURY DEPARTMENT
UNITED STATES COAST GUARD

General Rules and Regulations
FOR
VESSEL INSPECTION

GREAT LAKES

(Title 46, C F R., Parts 76 to 83, Inclusive)



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The "General Rules and Regulations for Vessel Inspection, Great Lakes," are applicable to merchant vessels subject to Title 52 of the Revised Statutes of the United States (Sections 4399 to 4500, inclusive) and acts amendatory thereof or supplementary thereto

This publication replaces the "General Rules and Regulations for Vessel Inspection, Great Lakes," dated May 1947, and includes all amendments published in the Federal Register through September 1, 1948. The rules and regulations covering boilers, pressure vessels, and appurtenances (which include castings, piping, valves, mountings, fittings, etc., and the design, construction, installation, and inspection thereof) are contained in a separate publication entitled, "Marine Engineering Regulations and Material Specifications." The rules and regulations relative to the examinations for the issuing of licenses, certificates, raise of grade, etc., and other matters relative to merchant marine personnel, are in a separate publication entitled, "Rules and Regulations for Licensing and Certifying of Merchant Marine Personnel." The rules and regulations governing tank vessels and tank barges are contained in a separate publication entitled, "Tank Vessel Regulations."

General authority over and responsibility for the administration and enforcement of the laws and regulations governing navigation and inspection of merchant marine vessels in the several Coast Guard districts are vested in and imposed upon the Coast Guard District Commanders in charge of such districts.

Shipowners, operators, builders, vessels' operating forces, and other persons affected by the Navigation and Inspection Laws and Regulations should familiarize themselves with the provisions contained herein. To this end, Coast Guard personnel concerned with the administration and enforcement of these laws and regulations will extend every possible assistance.



J F FARLEY,
Admiral, United States Coast Guard, Commandant

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TITLE 46—SHIPPING

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76 14	Equipment for lifeboats on vessels of classes (a), (b), (c), (d), and (e)	76 49	Handling of the boats and rafts
76 14a	Equipment for lifeboats on vessels of class (f)	76 50	Certificated lifeboatmen, manning of the boats
76 15	How lifeboats shall be carried; davits and cranes required	76 51	Manning of the boats
76 15a	Mechanical means for lowering	76 51a	Buoyant apparatus
76 16	Drawings, specifications, name plate	76 52	Life preservers
76 17	Inspection of lifeboats when built	76 53	Life buoys
76 18	Construction of metallic lifeboats of class 1A	76 54	Self-igniting water lights
76 19	Construction of wooden lifeboats	76 56	Steering apparatus
76 20	Air tanks of lifeboats	76 56a	Embarkation aids
76 21	Carrying capacity of lifeboats	76 57	Bulkheads
		76 58	Means of escape from steam vessels
		76 58a	Storm shutters, means of escape from boiler-house to engine room
		76 60	Distress signals in pilothouse or on navigator's bridge
		76 61	Vessel's name on equipment
		76 62	Disengaging apparatus

Section 76.01 Definition of terms. Certain terms used in the regulations in this subchapter are defined as follows

(a) **Commandant.** This term means Commandant of the Coast Guard.

(b) **Coast Guard District Commander.** This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspections, enforcement, and administration of Title 52, R. S., and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(c) **Officer in Charge, Marine Inspection.** This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection district for the performance of duties with respect to the inspections,

enforcement, and administration of Title 52, R S , and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(d) **Marine inspector or inspector** These terms mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspections, enforcement, and the administration of Title 52, R S , and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(e) **Headquarters.** This term means the Office of the Commandant, Washington, D C

76 1 Great Lakes steamers Under this designation shall be included all steam vessels navigating the Great Lakes

76 2 Classes of vessels. For the purpose of apportioning lifeboat and life-raft equipment upon Great Lakes steam vessels subject to the jurisdiction of the Coast Guard they shall be divided into the following classes

- (a) Passenger steam vessels navigating more than 3 miles offshore
- (b) Passenger steam vessels navigating not more than 3 miles offshore
- (c) Passenger steam vessels navigating routes where the water is not of a depth on any part of the route to submerge the upper deck of the vessel
- (d) Passenger steam vessels the keels of which are laid after July 1, 1915, for service on routes more than 3 miles offshore
- (e) Cargo steam vessels
- (f) All steam vessels not otherwise provided for

76 3 Lifeboats and life rafts required on vessels of class (a) Vessels of class (a) shall be required to have lifeboat and life raft capacity to accommodate all persons on board. Not less than 75 percent of the total capacity shall be in lifeboats and 25 percent may be in collapsible lifeboats or life rafts of an approved type. Vessels of this class navigating during the interval between May 15 and September 15 in any one year, both dates inclusive, shall be required to be equipped with only such lifeboats and life rafts as will accommodate 50 percent of all persons on board, of which accommodation not less than two-fifths shall be in lifeboats and three-fifths may be in collapsible lifeboats or life rafts of an approved type

76 4 Lifeboats and life rafts required on vessels of class (b). Vessels of class (b) shall be required to have lifeboat and life raft capacity to accommodate all persons on board. Not less than 25 percent of the total capacity shall be in lifeboats and 75 percent may be in collapsible lifeboats or life rafts of an approved type. Vessels of this class navigating during the interval between May 15 and September 15 in any one year, both dates inclusive, shall be required to be equipped with only such lifeboats and life rafts as will accommodate 10 percent of all persons on board, of which accommodation not less than 25 percent shall be in lifeboats and 75 percent may be in collapsible lifeboats or life rafts of an approved type

76 5 Lifeboats and life rafts required on vessels of class (c) Vessels of class (c) shall be required to have lifeboat and life raft capacity to accommodate all persons on board. Not less than 25 percent of the total capacity shall be in lifeboats and 75 percent may be in collapsible lifeboats or life rafts of an approved type. Vessels of this class navigating during the interval between May 15 and September 15 in any one year, both dates inclusive, shall be required to be equipped with only such lifeboats and life rafts as will accommodate 10 percent of all persons on board, of which accommodation not less than 25 percent shall be in lifeboats and 75 percent may be in collapsible lifeboats or life rafts of an approved type

76 6 Lifeboats and life rafts required on vessels of class (d) Vessels of class (d) shall be required to have lifeboat and life raft capacity to accommodate all persons on board. Not less than 75 percent of the total capacity shall be in lifeboats and 25 percent may be in collapsible lifeboats or life rafts of an approved type. Vessels of this class navigating

during the interval between May 15 and September 15 in any one year, both dates inclusive, shall be required to be equipped with only such lifeboats and life rafts as will accommodate 50 percent of all persons on board, of which accommodation not less than two-fifths shall be in lifeboats, and three-fifths may be in collapsible lifeboats or life rafts

76 6a Life floats substituted for life rafts required on vessels of classes (a), (b), (c), and (d) Life floats may be substituted for life rafts required by §§ 76 3—76 6, inclusive, of this part, during the interval between May 15 and September 15 in any one year, both dates inclusive

76 6b Additional life rafts required on vessels of classes (a), (b), (c), and (d). All vessels of classes (a), (b), (c), and (d) shall have, in addition to all other lifeboats and life rafts required, one additional fully equipped life raft which shall be stowed in such a manner that it will float clear in the event of sinking of the vessel On all vessels of 300 gross tons and over the life raft shall be not less than 15-person capacity

76 7 Lifeboats and life rafts required on vessels of class (e) Vessels of class (e) shall be required to have lifeboat capacity to accommodate all persons on board, and all such vessels of 300 gross tons and over shall have, in addition, one fully equipped life raft of not less than 15-person capacity on board which shall be stowed in such a manner that it will float clear in the event of sinking of the vessel

76 8 Lifeboats and life rafts required on vessels of class (f). Steam vessels of 50 gross tons and over not carrying passengers shall be required to have lifeboat and life raft capacity to accommodate all persons on board, of which accommodation not less than 50 percent shall be in lifeboats and 50 percent may be in collapsible lifeboats or life rafts of an approved type

Steam vessels of less than 50 gross tons not carrying passengers shall be required to have lifeboat or life raft capacity to accommodate all persons on board

Steamers of less than 150 gross tons, while engaged exclusively in harbor towing, may substitute one or more life rafts for the lifeboats required, when the lifeboats interfere with the practical operation of the steamer and such substitution may be made with safety, it being understood that when such vessel engages in service other than harbor towing she shall be equipped with lifeboats as required by the rules.

Towing vessels of 300 gross tons and over shall have, in addition to other lifeboats and life rafts required, one fully equipped life raft of not less than 15-person capacity on board which shall be stowed in such a manner that it will float clear in the event of sinking of the vessel

Pleasure steam vessels navigating more than 3 miles offshore shall have the same lifeboat and life raft capacity as vessels of class (a)

Pleasure steam vessels navigating not more than 3 miles offshore shall have the same lifeboat and life raft capacity as vessels of class (b)

Steamers that are used exclusively as fireboats and connected or belonging to a regularly organized fire department shall be required to carry only such boats or rafts as in the judgment of the Officer in Charge, Marine Inspection, or Coast Guard District Commander may be necessary to carry the crew

Fueling, repair, and other nondescript steam vessels, regardless of tonnage, when confined to rivers tributary to the Great Lakes, harbors, or canal navigation, shall be equipped with lifeboats or life rafts of sufficient capacity to accommodate at one time all persons on board

Lifeboats and other equipment required on ferryboats are prescribed in Part 80, and on towed passenger barges in Part 82 of this chapter

76.9 Wooden surfboat or seine boat. Vessels engaged exclusively in the business of seine fishing or wrecking may substitute a wooden seine boat or a wooden surfboat for the lifeboat required on vessels of class (f)

76 10 Lifeboats and rafts required on inspected motor vessels All vessels propelled by machinery, other than steam, subject to the inspection laws of the United States shall be required to have the same lifeboat and life raft equipment as steam vessels of the same class and Officer in Charge, Marine Inspection, shall so indicate in the certificate of inspection. This section shall not apply to such vessels under 50 tons, when navigating in daylight only, and when equipped with air tanks under deck of sufficient capacity to sustain afloat the vessel when full of water, with her full complement of passengers and crew on board, or when properly subdivided by iron or steel watertight bulkheads of sufficient strength and so arranged and located that the vessel will remain afloat with her complement of passengers and crew on board with any two compartments open to the sea.

76 12 Working boat Steamers of 200 gross tons and upward carrying passengers shall have one working boat with life line attached, properly supplied with oars and painter, and kept in good condition at all times and ready for immediate use, in addition to the lifeboats required.

76.13 Motor-propelled lifeboats on vessels Any vessel under the jurisdiction of the Coast Guard may be allowed to carry one motor-propelled lifeboat as a part of the lifeboat equipment required on such vessel, except that on vessels carrying more than six lifeboats under davits two of such lifeboats may be equipped with motors.

Gasoline may be used for such motors when it is carried only in substantial seamless steel, welded steel, or copper tanks securely and firmly fitted in such lifeboats and located where the greatest safety will be secured.

All fittings, pipes, and connections shall be of the highest standard and best workmanship and in accordance with the best modern practice. Storage of gasoline other than in the lifeboats using it shall not be allowed under any circumstances.

In computing the cubic capacity of motor-propelled lifeboats the space required for the engine, boiler, motor, and fuel shall be excluded.

76.14 Equipment for lifeboats on vessels of classes (a), (b), (c), (d), and (e). All lifeboats on vessels of classes (a), (b), (c), (d), and (e) shall be equipped as follows:

(a) **Bailer.** One bailer of sufficient size and suitable for bailing with lanyard attached.

(b) **Boathook.** One boathook of clear-grained wood of suitable length but not less than 8 feet long by 1½ inches in diameter.

(c) **Bucket.** One galvanized iron bucket, of about 2 gallons capacity, with lanyard attached.

(d) **Compass.** One efficient liquid compass with not less than a 2-inch card.

(e) **Distress signals** (1) Twelve approved hand red flare distress signals in a watertight container, or twelve approved hand combination flare and smoke distress signals in a watertight container. Service use shall be limited to a period of three years from date of manufacture. Distress signals not bearing date of manufacture shall not be carried after January 1, 1949. (For specifications for the above signals see subparts 160 021, 160 022, and 160 023 in Subchapter Q of this chapter.)

(2) Either an approved flashlight or twelve approved parachute red flare distress signals and an approved means of projecting them, all contained in a portable watertight case, may be substituted for six of the above distress signals, but at least six of the above hand red flare distress signals shall be carried. Service use of the signals shall be limited to a period of three years from date of manufacture. (For specifications for the parachute red flare distress signal equipment, see subparts 160 024 and 160 036 in Subchapter Q of this chapter.)

NOTE—The specifications for distress signals are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the manufacture of equipment, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C., and are identified as follows:

160 021 Signals, Distress, Flare, Red, Hand (46 CFR Subpart 160 021).

- 160 022 Signals, Distress, Smoke, Orange, Floating (46 CFR Subpart 160 022)
 160 023 Signals, Distress, Combination Flare and Smoke, Hand (46 CFR Subpart 160 023)
 160 024 Signals, Distress, Pistol-Projected Parachute, Red Flare (and Signal Pistol) (46 CFR Subpart 160 024)
 160 036 Signals, Distress, Hand-Held Rocket-Propelled Parachute Red Flare (46 CFR Subpart 160 036)

(f) **Flashlight** (Optional, see paragraph (e) of this section) On and after September 1, 1945, one approved type I, size No 3 flashlight complying with current U S Coast Guard Specification for Flashlights, Electric, Hand ¹ No battery cell shall remain in the flashlight beyond the serviceability date appearing on the cell or its jacket A flashlight which obtains its source of energy from other than dry cells may be used provided such flashlight has been approved by the Commandant, United States Coast Guard Approved flashlights not conforming to the above referred to specification which are on board vessels prior to September 1, 1945, may be continued in service provided they are in good and serviceable condition, when replacement of these flashlights is effected, said flashlights shall comply with the requirement contained in this regulation

(g) **Hatchets** Two hatchets attached to the boat by individual lanyards and readily available for use, one at each end of the boat All hatchets provided for use on vessels on and after December 1, 1944, shall be of an approved type Hatchets provided prior to December 1, 1944, may be continued in service provided they are in good and serviceable condition

(h) **Illuminating oil** One gallon of illuminating oil in a metal container

(i) **Lantern** One lantern containing sufficient oil to burn at least 9 hours and ready for immediate use

(j) **Life line** A life line, properly secured the entire length of each side, festooned in bights not longer than 3 feet, with a seine float in each bight The line shall be of a size and strength not less than 12-thread manila rope, and the seine float in each bight shall hang to within 12 inches of the surface of the water when the boat is light

(k) **Life preservers** Two life preservers

(l) **Matches** One box of friction matches in a watertight container, and carried in a box secured to the underside of the stern thwart or stowed in the locker

(m) **Oars** A full complement of oars, two spare oars and a steering oar with rowlock or becket conforming to the following requirements

Number and length of oars

Length of boat	Minimum number of oars	Spare oars	Total, including steering oar	Rowing oars minimum length	Steering oar, minimum length
16 feet and under 18 feet	4	2	7	<i>Feet</i> 10	<i>Feet</i> 12
18 feet and under 20 feet	4	2	7	11	12
20 feet and under 24 feet	4	2	7	12	14
24 feet and under 28 feet	6	2	9	14	16
28 feet and over	6	2	9	15	16

NOTE.—Motor lifeboats and lifeboats fitted with propellers operated by hand shall be equipped with four oars and one steering oar

(n) **Painter** One painter of manila rope not less than 2¾ inches in circumference and of a length not less than 3 times the distance between the boat deck and the light draft

(o) **Plugs** Each drain hole, fitted with an automatic plug, shall be provided with two caps attached by chains Where an automatic plug is not provided for the drain hole, there shall be two plugs attached by chains

(p) **Rowlocks.** One set and half of thole pins or rowlocks attached to the boat by separate chains

¹ A copy of the specifications is on file in the office of the FEDERAL REGISTER, and copies may be obtained upon request from the Commandant (MMT), United States Coast Guard, Washington 25, D C, or any Coast Guard District Commander

(g) **Rudder.** One rudder with tiller or yoke and yoke lines Where it is difficult to install a rudder in boats of special construction, it may be omitted

(r) **Sea Anchor.** On and after January 1, 1944, all sea anchors shall be of an approved type

NOTE—Sea anchors installed prior to January 1, 1944, meeting the requirements of regulations effective at the time of installation may be continued in use if in serviceable condition

(s) **Parachute flare distress signals** (Optional, see distress signals in paragraph (e) of this section) The stowage of parachute flare distress signals in lifeboats is discretionary with the master

(t) **Storm oil** One gallon of vegetable or animal oil in a container, so constructed that the oil can be easily distributed on the water and so arranged that it can be attached to the sea anchor

(u) **Stowage of equipment.** All loose equipment shall be securely attached to the lifeboat to which it belongs The stowage of signal pistol outfits in lifeboats is discretionary with the master

76.14a Equipment for lifeboats on vessels of class (f) All lifeboats on vessels of class (f) shall be equipped as follows

(a) **Boathook.** One boathook of clear-grained wood of suitable length but not less than 8 feet long by 1½ inches in diameter

(b) **Bucket** One galvanized iron bucket, of about 2 gallons capacity, with lanyard attached

(c) **Hatchet.** One hatchet attached by a lanyard and readily available for use All hatchets provided for use on merchant vessels on and after December 1, 1944, shall be of an approved type Hatchets provided prior to December 1, 1944, may be continued in service provided they are in good and serviceable condition.

(d) **Life line.** A life line, properly secured the entire length of each side, festooned in bights not longer than 3 feet, with a seine float in each bight The lifeline shall be of a size and strength not less than 12-thread manila rope, and the seine float in each bight shall hang to within 12 inches of the surface of the water when the boat is light.

(e) **Life preservers.** Two life preservers

(f) **Oars** A full complement of oars and two spare oars

(g) **Painter** One painter of manila rope not less than 2¼ inches in circumference and of a length not less than 3 times the distance between the boat deck and the light draft

(h) **Plugs** Each drain hole, fitted with an automatic plug, shall be provided with two caps attached by chains Where an automatic plug is not provided for the drain hole, there shall be two plugs attached by chains

(i) **Rowlocks.** One set of rowlocks and two spare rowlocks attached to the boat by separate chains

(j) **Steering oar or rudder** One steering oar with rowlock or becket, or one rudder with tiller or yoke and yoke lines

(k) **Stowage of equipment** All loose equipment shall be securely attached to the lifeboat to which it belongs

76 15 How lifeboats shall be carried; davits and cranes required All lifeboats on vessels carrying passengers shall, if practicable, be carried under substantial davits or cranes, but if it is not practicable so to carry all the lifeboats required, the remainder shall be stowed near at hand, so as to be easily and readily launched Such davits, cranes, and necessary gear shall be such as will enable the lifeboats to be lowered to the water in less than 2 minutes from the time the clearing away of the boats is begun

Each lifeboat carried under davits shall be provided with two separate davits When a single crane is properly adapted to lower a lifeboat, it may be allowed to take the place of

the two davits. Such davits or cranes, and the blocks and falls thereof, on all passenger vessels except ferryboats, shall be of sufficient strength to carry the boat with its full load.

Vessels of class (e) and (f) shall be equipped with davits or other practicable means for properly launching the lifeboats. Mechanical davits, when installed on vessels of class (e) and (f), shall be subject to all the tests required by this section.

No type or make of mechanical or gravity davit shall be used unless it has first been approved by the Commandant.

No mechanical davits of a character which require manual or other power to turn the boats out to the position for lowering into the water shall be fitted on any vessel the keel of which is laid after September 1, 1941, if such davits are to handle a lifeboat which, without its complement of persons on board, but having on board all air tanks and other lifeboat equipment, exceeds 5,000 pounds total weight, i. e., 2,500 pounds for a single davit arm. An exemption to this requirement may be granted during the period of the national emergency proclaimed by the President on May 27, 1941, if evidence is presented to the Commandant to substantiate a claim that compliance with this requirement would materially delay the completion and delivery of the vessel.

Davits of an approved type, which are capable of swinging the boats into the lowering position without the application of any effort or external force other than that necessary to operate the releasing mechanism, allowing the boat to move from the stowed position to the lowering position by the force of gravity, shall be provided to handle all lifeboats the total weight of which, including air tanks and lifeboat equipment, but without the complement of persons on board, exceeds 5,000 pounds.

Where steel castings are used for davit frames or davit arms this material shall be fully annealed and comply with the following requirements:

(In substantial agreement with A. S. T. M. Spec. A-27-42 and A-215-41)

Tensile strength min. psi.....	66,000
Yield point min. psi.....	33,000
Elongation in 2 inches min. percent.....	22
Reduction of area min. percent.....	33

Chemical composition for castings not intended to be fusion welded

(In substantial agreement with A. S. T. M. Spec. A-27-42)

Manganese max. percent.....	1.00
Phosphorus max. percent.....	0.05
Sulphur max. percent.....	0.06

Chemical composition of castings intended to be fabricated by fusion welding

(In substantial agreement with A. S. T. M. Spec. A-215-41)

Carbon max. percent.....	0.30
Manganese max. percent.....	0.70
Phosphorus max. percent.....	0.05
Sulphur max. percent.....	0.06
Silicon max. percent.....	0.50

For each reduction of 0.01 percent below the maximum specified carbon content, an increase of 0.04 percent manganese above the specified maximum will be permitted up to a maximum of 1.00 percent.

Where structural steel is used for the fabrication of davit frames or davit arms the material shall conform to the following requirements:

(In substantial agreement with A. S. T. M. Spec. A-131-39 and A-7-42)

Tensile strength psi.....	60,000 to 72,000
Yield point min. psi.....	0.5 T S
Elongation in 8 inches min. percent.....	1,500,000
Elongation in 2 inches min. percent.....	Ten Str
	22

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(q) **Rudder.** One rudder with tiller or yoke and yoke lines Where it is difficult to install a rudder in boats of special construction, it may be omitted

(r) **Sea Anchor** On and after January 1, 1944, all sea anchors shall be of an approved type

NOTE—Sea anchors installed prior to January 1, 1944, meeting the requirements of regulations effective at the time of installation may be continued in use if in serviceable condition

(s) **Parachute flare distress signals** (Optional, see distress signals in paragraph (e) of this section) The stowage of parachute flare distress signals in lifeboats is discretionary with the master

(t) **Storm oil** One gallon of vegetable or animal oil in a container, so constructed that the oil can be easily distributed on the water and so arranged that it can be attached to the sea anchor

(u) **Stowage of equipment.** All loose equipment shall be securely attached to the lifeboat to which it belongs The stowage of signal pistol outfits in lifeboats is discretionary with the master

76 14a Equipment for lifeboats on vessels of class (f). All lifeboats on vessels of class (f) shall be equipped as follows

(a) **Boathook** One boathook of clear-grained wood of suitable length but not less than 8 feet long by 1½ inches in diameter

(b) **Bucket** One galvanized iron bucket, of about 2 gallons capacity, with lanyard attached

(c) **Hatchet.** One hatchet attached by a lanyard and readily available for use All hatchets provided for use on merchant vessels on and after December 1, 1944, shall be of an approved type Hatchets provided prior to December 1, 1944, may be continued in service provided they are in good and serviceable condition

(d) **Life line** A life line, properly secured the entire length of each side, festooned in bights not longer than 3 feet, with a seime float in each bight The lifeline shall be of a size and strength not less than 12-thread manila rope, and the seime float in each bight shall hang to within 12 inches of the surface of the water when the boat is light

(e) **Life preservers** Two life preservers

(f) **Oars** A full complement of oars and two spare oars

(g) **Painter.** One painter of manila rope not less than 2¼ inches in circumference and of a length not less than 3 times the distance between the boat deck and the light draft

(h) **Plugs** Each drain hole, fitted with an automatic plug, shall be provided with two caps attached by chains Where an automatic plug is not provided for the drain hole, there shall be two plugs attached by chains

(i) **Rowlocks** One set of rowlocks and two spare rowlocks attached to the boat by separate chains

(j) **Steering oar or rudder.** One steering oar with rowlock or becket, or one rudder with tiller or yoke and yoke lines

(k) **Stowage of equipment** All loose equipment shall be securely attached to the lifeboat to which it belongs

76 15 How lifeboats shall be carried; davits and cranes required. All lifeboats on vessels carrying passengers shall, if practicable, be carried under substantial davits or cranes, but if it is not practicable so to carry all the lifeboats required, the remainder shall be stowed near at hand, so as to be easily and readily launched Such davits, cranes, and necessary gear shall be such as will enable the lifeboats to be lowered to the water in less than 2 minutes from the time the clearing away of the boats is begun

Each lifeboat carried under davits shall be provided with two separate davits When a single crane is properly adapted to lower a lifeboat, it may be allowed to take the place of

the two davits Such davits or cranes, and the blocks and falls thereof, on all passenger vessels except ferryboats, shall be of sufficient strength to carry the boat with its full load

Vessels of class (e) and (f) shall be equipped with davits or other practicable means for properly launching the lifeboats Mechanical davits, when installed on vessels of class (e) and (f), shall be subject to all the tests required by this section

No type or make of mechanical or gravity davit shall be used unless it has first been approved by the Commandant

No mechanical davits of a character which require manual or other power to turn the boats out to the position for lowering into the water shall be fitted on any vessel the keel of which is laid after September 1, 1941, if such davits are to handle a lifeboat which, without its complement of persons on board, but having on board all air tanks and other lifeboat equipment, exceeds 5,000 pounds total weight, i e, 2,500 pounds for a single davit arm An exemption to this requirement may be granted during the period of the national emergency proclaimed by the President on May 27, 1941, if evidence is presented to the Commandant to substantiate a claim that compliance with this requirement would materially delay the completion and delivery of the vessel

Davits of an approved type, which are capable of swinging the boats into the lowering position without the application of any effort or external force other than that necessary to operate the releasing mechanism, allowing the boat to move from the stowed position to the lowering position by the force of gravity, shall be provided to handle all lifeboats the total weight of which, including air tanks and lifeboat equipment, but without the complement of persons on board, exceeds 5,000 pounds

Where steel castings are used for davit frames or davit arms this material shall be fully annealed and comply with the following requirements

(In substantial agreement with A S T M Spec A-27-42 and A-215-41)

Tensile strength min psi.....	66,000
Yield point min psi.....	33,000
Elongation in 2 inches min percent.....	22
Reduction of area min percent.....	33

Chemical composition for castings not intended to be fusion welded

(In substantial agreement with A S T M Spec A-27-42)

Manganese max percent.....	1 00
Phosphorus max percent.....	0 05
Sulphur max percent.....	0 06

Chemical composition of castings intended to be fabricated by fusion welding

(In substantial agreement with A S T M Spec A-215-41)

Carbon max percent.....	0 30
Manganese max percent.....	0 70
Phosphorus max percent.....	0 05
Sulphur max percent.....	0 06
Silicon max percent.....	0 50

For each reduction of 0 01 percent below the maximum specified carbon content, an increase of 0 04 percent manganese above the specified maximum will be permitted up to a maximum of 1 00 percent

Where structural steel is used for the fabrication of davit frames or davit arms the material shall conform to the following requirements

(In substantial agreement with A S T M Spec A-131-39 and A-7-42)

Tensile strength psi.....	60,000 to 72,000
Yield point min psi.....	0 5 T S
Elongation in 8 inches min percent.....	1,500,000
	Ten Str
Elongation in 2 inches min percent.....	22

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Where welding is employed in the construction of davits, the welders shall be qualified by the Coast Guard

All moving parts of davits shall be provided with bushings of nonferrous metal, roller or ball bearings properly lubricated

An inspector shall be present at the foundry where castings are made to witness the tensile and bend tests prescribed. The manufacturer shall furnish an affidavit stating that the required tests for annealing have been made. When the inspector has satisfied himself that such castings comply with the requirements, he shall stamp the davit arm and frame with the letters, U S C G, the initials of his name and the letters, F T, and date of inspection

Each davit and frame shall be tested for strength and operation at the place of manufacture in the presence of an inspector

All mechanical and gravity davit arms or frames shall be tested at the extreme outboard position by suspending from the eye or end of each davit arm a weight equal to the weight of the fully loaded and equipped boat (including full complement of persons at 165 pounds each) for which the davit is to be approved, plus 10 percent. Under this test, a davit arm or frame shall show no permanent set or undue deflection. While this test is being conducted, the frame and arms, if of cast material, shall be subjected to a test by being hammered to satisfy the inspector that the castings are sound and without flaw

While this test load is suspended, the operating gear of mechanical davits shall be tested by being operated from inboard to the extreme outboard position with the same operating crank or device used in actual practice aboard ship

The manufacturer shall affix to the davit arm and frame a heavy plate giving the name of the manufacturer, date of inspection, serial number, capacity load, space for the inspector's initials, and the letters U S C G. After the inspector has satisfied himself that the assembled installation meets the requirements, he shall stamp the manufacturer's plates with his initials. Each set of davits shall be marked with identical serial numbers by the manufacturer

No davit arm or frame comprising mechanical or gravity davits shall be placed on board any vessel until all of the requirements of the rules of this section have been fully complied with. Whenever mechanical or gravity davits or parts of davits, such as davit arms, or frames, are installed on vessels to take the place of davits, davit arms, or frames which have become damaged or broken, such davits or frames shall have the manufacturer's name plate affixed thereto

76.15a Mechanical means for lowering. (a) On all passenger vessels where the height of a boat deck exceeds 20 feet from the lightest seagoing draft, wire falls and mechanical means for lowering shall be provided for each set of davits

(b) Winches, proposed for use in new installations, shall be of approved type and those which are contracted for on or after January 1, 1942, shall, in addition to conforming to the following requirements, be subjected to the shop test with a 100-percent overload and opened up for examination prior to Commandant's approval

(c) Plans and detail specifications of all lifeboat winches shall be submitted by the manufacturer to the Commandant for type approval. The plans shall show dimensions of all parts and complete bill of material used in the construction of the winches. Where welding is employed in the construction of lifeboat winches the welders shall be qualified by the Coast Guard

(d) Inspection openings shall be provided in the winch housing or the housing shall be so arranged to permit examination. Screws, bolts, nuts, pins, etc., used in the internal and brake assemblies, shall be fitted with lock washers, cotter pins, or suitable backing stops

(e) Worm gears, spur gears, or a combination of both may be used in the construction of the lifeboat winches. All gears shall be machine cut and constructed of steel, bronze, or

other suitable materials. The use of cast iron for gears is not permitted. Gears shall be press-fitted on the shaft, and keys shall be properly fitted and secured.

(f) Motor clutches, when used, shall be of either frictional or positive engaging type. When one motor is used for two winches, the clutch shall be so arranged that only one winch shall be engaged at any one time. The clutch operating lever shall be capable of remaining in any position when subject to vibration, and shall be so arranged that when in neutral position both lifeboats may be lowered simultaneously.

(g) Winch drums for gravity davits shall be designed with grooves so that not more than one layer of the falls winds on the drum. Drums shall be so arranged as to keep the falls separated. The design shall also provide that the falls will be paid-out at the same rate.

(h) Winch drums for mechanical davits shall be designed with a minimum diameter of 16 times the diameter of the falls.

(i) All drums shall be properly flanged and the falls securely fastened. The use of connecting devices between the drums shall not be permitted unless bolted locking mechanism is provided.

(j) Each winch shall be provided with two brakes, one of which shall be a hand brake, the other a governor brake to automatically control the lowering speed of the lifeboat. The hand brake shall be arranged with a lever and counterweight so that when the lever is raised the brake is released and when the lever is lowered the counterweight will set the brake. The governor brake shall be designed so as to insure that the maximum rate of lowering consistent with safety is not exceeded, this, in general, shall not exceed 100 feet per minute. External brake bands shall be made of corrosive-resistant metal suitably lined. Internal brakes may be of the metallic shoe type. The brake drums shall be of steel.

(k) Bearings, gears, and other working parts shall be designed for and provided with positive means of lubrication. Worm gears shall operate in an oil bath. Means shall be provided so that the oil level in the gear casings may be checked. Manufacturers shall furnish a lubrication chart for each type of winch.

(l) Winches shall be designed so that they will operate by gravity when lowering. When vessels are fitted with nested lifeboats, special arrangements shall be provided to prevent boat falls from fouling on the drum when they are being recovered and means shall be provided for quick recovery of the falls by hand.

(m) Boat winches shall be provided with means so that the falls may be overhauled by hand. These means must be in addition to hand cranks, and may consist of a hand grab rim on the brake shaft or brake drum.

(n) Where power-driven winches are used with gravity davits, positive means of automatically cutting off the power to the winch shall be fitted to stop the travel of the lifeboat and cradle before reaching final stowed position, to prevent damage to installation.

(o) Where power-driven winches are used with other type davits, the positive means for controlling power to the winch shall be by a master switch or controller so arranged that the operator must hold the master switch or controller in the "on or hoist" position for hoisting, and when released will immediately shut off the power.

(p) Every winch shall be fitted with a name plate of noncorrosive material, giving the maximum loads approved, the date the winch was passed, the type, serial number, and the manufacturer's symbol. This plate is to be stamped with the inspector's initials, and the letters, U S C G.

(q) Suitable covers shall be provided, so fitted that ice formation may be readily broken adrift when necessary to operate the winch.

(r) Shop test. Each winch shall be subject to the following test:

(1) Winches shall be set up to simulate a ship installation.

(2) Winches shall be capable of lowering, without undue strain or distortion, a test weight of 10 percent overload, based on the weight of the largest boat the winch is intended

to handle, together with regular equipment and full number of persons (165 pounds for each person) The number of parts to the fall should be recorded

(3) Brake shall be capable of stopping and holding the test weight at any point by the action of the counterweight alone

(4) While the weight is being lowered through a range of not less than 20 feet, stops shall be made at intervals of several feet Brakes exposed to the weather shall also be tested under the load lowering condition with the braking surface wetted

(5) Winch must be capable of limiting the speed of lowering This should not in general exceed 100 feet per minute

(a) Installation tests Upon completion of the installation of all mechanical means for lowering lifeboats, and before the vessel is certificated for service, the following tests and examinations shall be made in the presence of an inspector

(1) Swing lifeboat out from chocks and lower to level for loading, at which point lifeboat shall be loaded with dead weight equivalent to the number of persons allowed (165 pounds per person) together with weight of equipment, plus 10 percent of the total load The boat should then be lowered to water, stopping at approximately 6-foot intervals by action of the counterweight alone During this test the following observations should also be made

(i) Brake action shall be smooth, but positive Brakes exposed to the weather shall also be tested under the load lowering condition with the braking surface wetted

(ii) Counterweight shall be capable of stopping and holding boat when released

(iii) Winch shall be capable of controlling the speed of lowering This should not in general exceed 100 feet per minute

(iv) No part of lowering gear shall show any distress under load

(v) Deck under winch and davits must be of sufficient strength to prevent any undue stress of the deck under load

(vi) Mechanical davits shall swing to extreme outboard position without slacking winch brake

(vii) Action of governor brake and lowering speed permitted by same should be noted

(viii) Determine that falls are of sufficient length to lower lifeboats to light load line with vessel listed to 15° either way

(2) If nested boats are used, the hand operated quick recovery mechanism shall be tested and the action must be easy enough to permit one man to recover falls

(3) A report of the results of the installation tests covering all the above points shall be recorded

76.16 Drawings, specifications, name plate (a) All lifeboats shall be substantially constructed in accordance with drawings, or blueprints, and specifications approved by the Commandant The approval of lifeboat shall include the arrangements for stowage of all equipment

(b) Builders of lifeboats shall furnish the Coast Guard District Commander of the district in which the lifeboats are built drawings, or blueprints, and specifications showing and explaining the construction of same, and showing the tensile strength and ductility of the metal used Lifeboats may be constructed of steel having a minimum tensile strength not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches, or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved metals Where steel is used and the minimum thickness of the metal is less than No 16 B W G, the elongation shall not be less than 15 percent in a gage length of 8 inches

(c) Builders of lifeboats shall affix a plate of brass or the equivalent to each lifeboat, having thereon the builder's name, number of boat, date of construction of boat, cubical contents of boat, and number of persons said boat will carry, as determined by the rules of the Commandant

76 17 Inspection of lifeboats when built. Coast Guard District Commanders of districts where lifeboats are built shall detail an inspector to any place where lifeboats are being built, whose duty it shall be to carefully inspect and examine the construction of such lifeboats, and he shall satisfy himself that such lifeboats are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders. When the inspector approves the construction of the boat he shall stamp his initials, together with the letters "U S C G," on a blank space on the plate required to be affixed to the boat by the builder. The initials of the inspector shall be satisfactory evidence to all parties interested that the boat has been constructed in accordance with the drawings, or blueprints, and specifications on file.

76 18 Construction of metallic lifeboats of class 1A. The following specifications and schedule of lifeboat material shall be complied with unless other arrangements in matters of constructional details, design, and strength equivalent in safety and efficiency are approved by the Coast Guard District Commander of the district in which the lifeboat is built.

(a) **Keel, stem, and sternpost.** The dimensions of bar keels, stems, and sternposts shall be as given in table. The keel, stem, and sternpost shall be in one length except in the case of a boat of stern-frame construction where the stem and keel shall be in one length, scarphed and riveted to the stern frame. The scarph connecting the keel to the stern frame shall have a length of nine times the thickness of the keel, or butt welded with suitable reinforcing straps on both sides.

(b) **Shell plating.** The gage of shell plating shall be as given in table and shall have a tensile strength of not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches, or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved metals. When the minimum thickness of the steel is less than No. 16 B W G the elongation shall be not less than 15 percent in a gage length of 8 inches. The bottom shell plating shall be increased to gages as shown in table for not less than 25 percent of the breadth each side of the keel. Doubling plates of suitable size shall be fitted on all steel boats at points where the shell is liable to corrosion from contact with the boat's chocks. All seam and butt laps shall lap at least $1\frac{1}{4}$ inches. The laps of joints on keel, stem, and sternpost shall be at least 2 inches.

(c) **Riveting.** The several plates composing the shell may be joined together either by riveting or welding. Where riveting is employed, it shall be by double riveting. The center of the row of rivets nearest the edge of a sheet shall be about three-eighths of an inch from the edge. The rivets shall be staggered with not less than 18 rivets to the foot, and such rivets shall have countersunk heads. The diameter of the rivets shall be not less than No. 10 B W G. The riveting of the shell plating to the keels, stems, and sternposts shall be with button-head rivets of the following diameters, said riveting to be staggered with not less than 12 rivets to the foot.

	Inch
Boats 24 feet or under.....	$\frac{3}{16}$
Over 24 feet, under 27.....	$\frac{1}{4}$
Over 27 feet, under 32.....	$\frac{5}{16}$

In the attachment of the keel to the garboard plate, the distance from the edge of the plate to the nearest row of rivets shall be about one-half an inch.

(d) **Welding.** Where welding is employed in lifeboat or life-raft construction it shall be in accordance with the following specifications for fusion welding of sheet metal and the welders shall be qualified by the Coast Guard.

(e) **Scope.** These specifications apply only to the application of fusion welding to lifeboats, life rafts, and similar vessels subject to pressures not to exceed 15 pounds per square inch.

(f) **Materials**—(1) **Base metal** The materials shall be steel or wrought-iron plates (galvanized) having a thickness of not less than No 18 B W G nor more than three-sixteenths inch

(2) **Filler metal** High-test electrode shall be used to insure a weld which will have an efficiency equal to the strength of the base metal without reenforcement

(g) **Process** Any process of welding which has been approved by the Commandant may be used in the fabrication of lifeboats and life rafts

(h) **Design of joints** The following joints are acceptable Butt joints or lapped joints, fillet welded at both edges

(i) **Application of welding** The plates shall be properly formed and secured by jigs, clamps, or other suitable devices to prevent sagging or warping The welder shall use due caution to avoid heating the plate to such an extent as to cause it to become distorted or warped Care shall be taken to insure that the weld has complete fusion, proper penetration to the full thickness, and is reasonably free from porosity Provision should be made to provide for reasonable expansion and contraction while the welding is being applied The weld shall be machined to a reasonable degree of smoothness and galvanized by spraying with zinc to protect against the weather

(j) **Supervision** Manufacturers who desire to construct lifeboats or life rafts by means of any process of fusion welding shall submit plans and specifications to the Coast Guard District Commander, showing in detail the design and methods of construction which they propose to employ The plans or specifications shall contain the following data

- (1) Tensile strength of the base metal
- (2) Elongation of base metal in a gage length of 4 inches
- (3) Trade name of electrode used
- (4) Elongation of filler metal in a gage length of 2 inches

(k) **Inspection and tests** Inspectors shall have access to lifeboats, life rafts, etc., under construction in order to ascertain whether the material and technique is such as to insure dependable workmanship Two tension and two bend test specimens of welding shall be taken from the first lifeboat or life raft constructed by fusion welding in any one order, thereafter two tension and two bend test specimens of welding shall be taken from one boat in each lot of 25 lifeboats and from 1 raft in each lot of 25 rafts in the same order The tension test specimens shall be made with a reduced section having a gage length of 4 inches The edges of the bend test specimens may be parallel Both tension and bend test specimens shall be made with the weld in the center The reenforcement shall be ground off, and the tension test specimen shall show under test a tensile strength at least equal to that of the base metal The bend test shall be made in a vise with the face of the weld in tension and must withstand being bent to a radius of twice its thickness without showing cracks or flaws The inspector making the tests shall satisfy himself that the workmanship is such that the boat or raft so constructed is at least equal in strength and dependability to an approved metallic lifeboat or raft of riveted construction

(l) **Floors** Floors shall be fitted in lifeboats 26 feet in length and over, of such dimensions as indicated in table The floors shall be flanged 1½ inches top and bottom and fastened to the skin by a single row of rivets ¾ inch in diameter and pitched 3 inches on centers Lumber holes shall be cut in the floors and so located as to provide efficient draining

(m) **Gunwales.** The dimensions of angular steel gunwales shall be as given in table The gunwales on each side of the lifeboat shall be in not more than two pieces If the gunwales are fitted in two lengths, the butts shall be kept beyond the midship half length of the boat and at opposite ends on each side The joint may be riveted or welded, and the backing-up piece shall be angular in section of the thickness of the gunwale, and the length shall be not less than eight times the depth of the gunwale It shall be secured to the sheer strake

by riveting or welding. The gunwales may be of clear grain oak or teak. When made in two lengths the gunwales shall be scarphed with a good long bevel scarph stiffened on the under side by a piece of the same material at least 2 feet long, $1\frac{1}{4}$ inches thick, and of the same width as the gunwale. Fastenings securing the gunwale bar or wooden gunwale to the sheer plate shall be spaced on 3-inch centers. The size of gunwales shall be of not less than the following dimensions:

Length of boat	Depth of gunwale	Width of gunwale	Length of boat	Depth of gunwale	Width of gunwale
	<i>Inches</i>	<i>Inches</i>		<i>Inches</i>	<i>Inches</i>
12 feet and not over 18 feet	1 $\frac{3}{4}$	2 $\frac{3}{4}$	Over 22 and not over 24 feet	2 $\frac{3}{4}$	2 $\frac{3}{4}$
Over 18 and not over 20 feet	1 $\frac{1}{4}$	2 $\frac{3}{4}$	Over 24 and not over 26 feet	2 $\frac{3}{4}$	2 $\frac{3}{4}$
Over 20 and not over 22 feet	2	2 $\frac{3}{4}$	Over 26 feet	2 $\frac{3}{4}$	2 $\frac{3}{4}$

(n) **Nosings.** The outside of the gunwale angle shall have a nosing of clear grain oak or teak secured to the sheer plate and the gunwale by fastenings spaced on 6-inch centers which fastenings may be substituted for alternate fastenings between the gunwale bar or the wooden gunwale and the sheer strake, the flat side of the nosing on boats not over 20 feet long shall be not less than $1\frac{1}{4}$ inches wide and $\frac{1}{2}$ inch thick, on boats over 20 feet and not over 24 feet it shall be not less than $1\frac{1}{4}$ inches wide and 1 inch thick, on all boats over 24 feet, it shall be not less than $2\frac{1}{4}$ inches wide and 1 inch thick.

Steel gunwales made from steel plates bent to a $\frac{1}{4}$ -inch inside radius need not be fitted with nosings. The vertical leg of the gunwale shall be outboard of the sheer strake.

(o) **Gunwale braces.** The gunwales shall be secured to the thwarts by steel braces and teed on the thwarts as follows:

Length of boat	Size of brace	Teed on thwarts
	<i>Inches</i>	<i>Inches</i>
22 feet and under	$\frac{1}{2}$ by $1\frac{1}{4}$	4
Over 22 feet	$\frac{3}{4}$ by $1\frac{1}{4}$	5

The gunwale braces shall be bolted to thwarts and riveted, or welded to gunwales.

(p) **Breast plates.** Breast plates shall be fitted to the stem and sternpost, the thickness of the breast plates to be not less than the thickness of the leg of the gunwale. The depth of the throat of the plate shall not be less than twice the depth of the gunwale.

(q) **Thwarts.** The dimensions of the thwarts shall be as given in table except that the mast thwarts shall be 2 inches wider and the hole properly reenforced. The number of thwarts shall be not less than the following:

Length of boat	Number of thwarts
Under 18 feet	4
18 feet and under 24	5
24 feet and under 28	6
28 feet and under 32	7

The thwart ends shall be fitted between flanges and secured thereto by bolts in addition to the bolts through the gunwale braces. The U-flange shall extend inboard to take the brace bolt, which shall be 1 inch in width less than the thwart. Stretchers or lower cross seats of sufficient size and strength shall be fitted in suitable positions for the efficient rowing of all boats. In boats over 20 feet in length where lower cross or side seats are required to be fitted, they shall be well secured and supported. They shall not be placed more than 12 inches above the floors.

(r) **Stanchions.** Stanchions shall be fitted in all lifeboats where the unsupported length of the thwarts exceeds $4\frac{1}{4}$ feet.

(s) **Footings** Footings shall cover the bottom of the boat between the side tanks, spaced not more than 2 inches apart. The width of the footings shall be not less than 7½ inches except the center footing, which shall be not less than 9½ inches. The footings shall be made readily portable and so arranged that the plugs are at all times directly accessible without removing any fitting.

Metallic lifeboat

Length of boat not over—	Bar keel, stem, and stern post	Angle bar gunwales	Shell plate		Depth not less than—	Floors		Nosing hollow round	Fir or yellow pine thwart	Fir or yellow pine stanchions	Fir or pine side and end benches	Yellow pine footings	Tackle and painter shackles
			Side plating	Bottom plating		Thickness	Spacing not more than—						
Inches	Inches	Inches			In		In	Inches	Inches	Inches	In	In	In
12 feet 0 inches	2½ x ½	2 x 1½ x ¼	No 18 B W G	No 18 B W G				2 x ¼	1½ x 7¼	1½ x 4½	¾	¾	¾
14 feet 0 inches	2½ x ½	2 x 1½ x ¼	do	do				2 x ¼	1½ x 7¼	1½ x 4½	¾	¾	¾
16 feet 0 inches	2½ x ½	2 x 1½ x ¼	- do -	do -				2 x ¼	1½ x 7¼	1½ x 4½	¾	¾	¾
18 feet 0 inches	2½ x ½	2 x 2 x ¼	do	do				2 x ¼	1½ x 7¼	1½ x 4½	¾	¾	¾
20 feet 0 inches	2½ x ½	2 x 2 x ¼	No 18 B W G	No 18 B W G				2 x ¼	1½ x 7¼	1½ x 4½	¾	¾	¾
22 feet 0 inches	2½ x ½	2 x 2 x ¼	do	do				2 x ¼	1½ x 7¼	1½ x 4½	¾	¾	¾
24 feet 0 inches	3 x ¾	2½ x 2 x ¼	do	do				2 x ¼	1½ x 9	1½ x 4½	¾	¾	¾
26 feet 0 inches	3 x ¾	2½ x 2 x ¼	No 14 B W G	No 13 B W G	6	No 14 B W G	36	2 x ¼	1½ x 9	1½ x 5½	¾	¾	¾
28 feet 0 inches	3½ x ¾	2½ x 2½ x ¼	do - -	do - -	6	do - -	36	2 x ¼	1½ x 9	1½ x 5½	¾	¾	¾
30 feet 0 inches	3½ x ¾	2½ x 2½ x ¼	do - -	do - -	6	do - -	30	2 x ¼	1½ x 9	1½ x 5½	¾	¾	¾
32 feet 0 inches	4 x ¾	2½ x 2½ x ¼	do	do		do	30	2 x ¼	1½ x 9	1½ x 5½	¾	¾	¾

(t) **Hoisting shackles.** Hoisting or lifting shackles when installed in the ends of lifeboats shall have the shackle pins go through the stem and sternpost. Sectional area around the shackle pinhole shall be at least equal to the area of the shackles specified for the lifeboat. In cases where the lifting shackles are required to be installed inside of the lifeboat, such lifting shackles shall be attached to bracket plates, riveted to stem and sternpost or to rods with bracket plates riveted to keel. The complete unit for each boat of the brackets, rods, and connecting bolts shall be of sufficient strength to support the loaded lifeboat with a safety factor of 6. Hooks may be allowed in lieu of lifting shackles when constructed with a safety factor of 6, except when disengaging apparatus is required. Rings or links shall not be attached to lifeboats for hoisting purposes. When attached to the lower tackle blocks they shall be of such strength as to resist the proof load test without set, six times the maximum working load. The safety factor of 6 referred to is on material having a tensile strength of 58,000 to 65,000 pounds per square inch.

(u) **Plug.** Each lifeboat shall be fitted with an automatic plug.

(v) **Galvanizing and plating.** All steel or iron entering into the construction of lifeboats shall be galvanized by the hot process.

76.19 Construction of wooden lifeboats—(a) Materials The timber shall be of the best quality, well seasoned, free from sapwood, shakes, and objectionable knots. The other materials shall be of the best of their respective kinds.

(b) **Framings.** Keels, stems, sternposts, aprons, and deadwoods shall be oak or elm with no short grain or shakes. Parts having considerable curvature shall be oak or hackmatack grown to form. The stem and sternpost are to be rabbeted to take the plank ends and form an efficient stop for the caulk. The depth of the rabbet shall not exceed the thickness of the plank. Aprons shall be of sufficient size to insure a 3-inch faying surface and receive the double fastenings of the hooded ends. Deadwoods are to be of the same size as the keel and are to scarph properly with the apron and keelson. The timbers are to be checked into the deadwoods and cavities filled with marine glue to form a water course. Keel and hog piece shall be elm or oak, and the keel shall be in one length. Scarphs connecting the stem and sternpost to the keel may be either vertical or horizontal. The vertical scarphs shall be secured by five clinched nails, and the horizontal or flat scarphs shall be properly lipped and secured by at least two through fastenings. Ordinary tenons shall

not be accepted as equivalent to scarphs. Stem bands shall be galvanized wrought iron and extend from the breasthook over the stem head to keel plate or 2 feet abaft the scarph.

(c) **Planking.** The planking may be of the clincher, carvel, or multiple-skun type, the carvel and double plank to be recommended, especially the latter when for use on vessels in tropical trades. In clincher-built boats the extreme breadth of the plank is not to exceed $5\frac{1}{2}$ inches, except in the four strakes next to the keel, which may be as follows: Two at 7 inches, one at $6\frac{1}{2}$ inches, and one at 6 inches. In boats 18 feet in length and under, these breadths may require to be reduced about an inch. The landings shall not be less than seventh-eighths inch in breadth. The planks should be in as long lengths as possible, with an efficient shift of butts. There shall be at least two passing strakes between butts in the same timber space.

(d) **Timbers.** Timbers shall be elm or oak bent to shape and fitted in one length from gunwale to gunwale, except in the extreme ends of the boats. The spacing of timbers shall not exceed 6 inches center to center.

(e) **Stiffeners.** Keelsons shall be in one length and overlap the deadwoods so as to take all the fastenings of the lifting plates. A substantial hardwood chock shall be well secured to the keelson to form a mast step; the keelson shall not be cut for the purpose. The bulge stringers and risings should be in as long lengths as possible, properly scarphed at the butts, and either through fastened at each timber or fastened at each timber with a brass screw. In boats 25 feet in length and over, the heads of the timbers are to be carried up and connected through the sheer strake and gunwale. In all boats, provisions shall be made for double-banking the oars.

(f) **Thwarts and stanchions, etc.** The number of thwarts shall not be less than given by the following:

Lifeboats, length in feet.	Number of thwarts
18 and under.....	4
Over 18 and not over 24.....	5
Over 24 and not over 28.....	6
Over 28 and not over 30.....	7

The distance of the top of the thwarts below the top of the gunwale shall be as follows.

Lifeboats, length in feet	Inches
22 and under.....	9
Over 22 and not above 28.....	10
Over 28 and not above 30.....	11

The thwarts shall be scored over the timbers and directly attached to the risings by means of two screws at each end. In all boats where the unsupported length of the thwarts exceeds 5 feet, stanchions well connected to the thwart and to the side of keelson shall be fitted. The side benches shall be continuous and fitted in as long lengths as possible, they shall not be removable, but form part of the permanent structure of the boat. In boats over 20 feet in length where lower cross or side seats are required to be fitted, they are to be well secured and supported. They shall be placed as low as practicable. Stretchers or lower cross seats of sufficient size and strength are to be fitted in suitable positions for the efficient rowing of all boats. All lower seats and bottom boards are to be made readily portable, and so arranged that the plugs are at all times directly accessible without removing any fitting. The plug chains are to be securely attached to the boat by screws.

(g) **Thwart knees.** The knees shall be of wrought or stamped iron, galvanized, $1\frac{1}{2}$ inches thick at the thwart. In lifeboats over 24 feet in length, the knees shall be double, but, in lieu thereof, iron knees of special design may be adopted. The knees shall be connected to the side of the boat and to the thwarts by at least two through fastenings in each arm. Nut-and-screw bolts are recommended for the purpose. The bolts should be cup-headed and the nuts have iron plate washers on the under side of the thwarts. Any additional

fastenings may be stout screws, but spike or wire nails are not to be allowed. A hardwood chock 3 inches wide should be fitted between knee and side of boat to receive knees and fastenings of sheer strake. Where wood knees are preferred, they should be of oak, ash, elm, or hackmatack grown to form. The fastenings may be galvanized iron, but wire nails shall not be allowed.

(h) **Breasthooks.** The sides of the boat at the ends shall be well bound together across the middle line, the breasthooks being of sufficient number and size, having regard to the dimensions and form of the boat. The arms are to extend along the sides of the boat for at least two timber spaces and are to be through fastened by two bolts in each arm and one through the throat. The breasthooks are to be galvanized iron, or oak or hackmatack grown to form.

(i) **Rubbers, filling pieces, bilge keels.** Fore and aft rubbers shall be fitted to all boats. Clincher-built boats are to have filling pieces for about one-third of the boat's length amidships, fitted to the projecting plank edges from the gunwale to the bilge. In all boats intended to accommodate more than 60 persons, vertical fenders extending from the gunwale down to the bilge, are to be fitted to facilitate launching on the high side of a listed ship. These fenders are to be sufficient in number to prevent damage to the boats when being lowered. If the fenders are of wood they are to have cope iron fitted to the outside edges. Particulars of any proposed arrangements, including alternatives such as skates or rollers temporarily secured to the boat to prevent it from being damaged, and to facilitate launching, are to be submitted for the Commandant's approval. When bilge keels are fitted, they shall be secured to a doubling plank well fastened to the bottom planking and timbers by brass screws. Bilge-keel fastening shall not penetrate the bottom planking. Suitable hand grips shall be made in the bilge keels for use in event of capsizing.

(j) **Fastenings.** Fastenings of the keel, stem and sternpost, aprons, knees, keelsons, or deadwood shall be through fastenings wherever practicable, or long screws. There shall not be less than six through fastenings in the deadwood at each end of the boat. The hog shall be secured to the keel by galvanized screws 8 inches to 7 inches apart, and the keelson to the keel by through fastenings 24 to 27 inches apart. In boats over 23 feet in length, the hog may be in two pieces, provided it is scarphed to the satisfaction of the inspector. Box gunwales shall be through fastened at every timber, and solid gunwales should be secured with at least four through fastenings between each pair of thwart knees and strengthened by check pieces in way of rowlocks. All gunwales when not fitted in one length shall have either lipped or table scarphs, and the scarphs of gunwale shall be kept if possible beyond midship half length of the boat. Plank fastenings shall be copper of sufficient length and gage, and those in the plank edges, scarphs, and timbers properly clinched. One fastening is required between the timbers in each edge of each plank, subject to a maximum spacing of 3½ inches in clincher-built boats.

76.20 Air tanks of lifeboats. All lifeboats constructed after June 30, 1905, shall be provided with air tanks, and in all lifeboats of 18 feet in length or over for lake, bay, or sound steamers contracted for after September 30, 1912, not more than 50 percent of the air-tank capacity shall be allowed in the ends of the boat, and the remaining capacity shall be located in the side tanks. *Provided, however,* That wooden lifeboats for use on steam pleasure vessels shall be exempt from the use of air tanks.

After June 20, 1912, the air tanks of all lifeboats shall be entirely independent of the hull or other construction and shall be of suitable noncorrosive material and of a capacity of not less than 1.5 cubic feet for each person allowed in metallic boats and not less than 1 cubic foot for each person allowed in wooden boats. *Provided,* That in all metallic boats constructed and inspected on and after March 1, 1931, there shall be at least 1 cubic foot for each person allowed in addition to sufficient air tank capacity to float the boat (including its equipment), when filled with water. Such air tanks shall be firmly and securely fastened

in the hull, and in such manner as will allow them to be temporarily removed, and in no case shall the tanks be punctured or opened for such fastenings. The tops of such tanks shall be thoroughly protected by a grating or platform or by the thwarts or seats. Such air tanks of 6 cubic feet or less shall be constructed of material of a thickness not less than No. 22 B. W. G., from 6 cubic feet to and including 15 cubic feet, of a thickness not less than No. 20 B. W. G., and all air tanks of more than 15 cubic feet capacity shall be of a thickness not less than No. 18 B. W. G.

All joints of air tanks shall be properly double riveted and tightly calked or securely hook-jointed and efficiently soldered or properly and securely welded, and such air tanks shall be located in such a manner that will permit the lifeboat to be on as near an even keel as possible when flooded with water.

The cubic contents of air space of air tank shall be stamped on the tank where same can be seen when air tank is placed in boat.

All air tanks shall be fitted with a connection of one-half inch outside diameter for testing purposes.

Before any lifeboat is passed, and accepted, the air tanks thereof shall be tested in the presence of an inspector by an air pressure of not more than 1 pound to the square inch. At each subsequent annual inspection, or oftener if in the opinion of the inspectors it is necessary or desirable, the inspectors shall satisfy themselves that the tanks are in good condition, but pressure need not be applied unless the inspectors are in doubt regarding the efficiency of the tanks. This does not take from the inspectors the right and authority to satisfy themselves at any time, either by examination or pressure, as to the condition of the tanks.

76 21 Carrying capacity of lifeboats. The capacity of all lifeboats not otherwise provided for shall be determined by the following rule. Measure the length and breadth outside of the planking or plating and the depth inside at the place of minimum depth. The depth used in calculating shall not in any case exceed 45 percent of the breadth. The product of these dimensions multiplied by 0.6 resulting in the nearest whole number shall be deemed the capacity in cubic feet.

To determine the number of persons a boat is to carry, divide the result by 10.

Example The carrying capacity of a boat 22 feet in length, 6 feet in breadth, and 2½ feet in depth shall be determined as follows

$$\frac{22 \times 6 \times 2\frac{1}{2} \times 0.6}{10} = \frac{198}{10} = 19 \text{ persons}$$

Every lifeboat shall have sufficient room, freeboard, and stability to safely carry the number of persons allowed to be carried by the above rule, which fact shall be determined by actual test in the water at the time of the first inspection of the lifeboat, except that where a vessel is carrying lifeboats of different types or capacities, at least one lifeboat of each type or capacity shall be so tested.

76.22 Numbering and marking of lifeboats. (a) The number of each lifeboat shall be plainly marked or painted on each side of the bow in figures 3 inches high, and, where lifeboats are carried on both sides of the vessel, the odd-numbered boats shall be stowed on the starboard side and the even-numbered boats on the port side, i. e., lifeboat No. 1 shall be forward on the starboard side, and lifeboat No. 3 next abaft lifeboat No. 1, lifeboat No. 2 shall be forward on the port side and lifeboat No. 4 next abaft lifeboat No. 2, etc. Where lifeboats are nested, the lifeboat under the lifeboat No. 1 shall be numbered 1A, the lifeboat under lifeboat No. 2 shall be numbered 2A, etc.

(b) The cubical contents and number of persons allowed to be carried on each lifeboat shall be plainly marked or painted on each side of the bow in letters and numbers 1½ inches high. In addition, the number of persons allowed shall be plainly marked or painted on

the top of at least two of the thwarts in letters and numbers 3 inches high. Such letters and numbers shall be dark on a light ground or light on a dark ground.

76.23 Lifeboats and life rafts kept clear for launching. The decks on which lifeboats of any class or life rafts are carried shall be kept clear of freight or any other obstruction that would interfere with the immediate launching of the lifeboats or life rafts.

76.24 Boat-davit falls and receptacles therefor. Blocks and falls installed after January 1, 1942, shall conform to the following requirements:

All blocks, falls, fairleads, padeyes, fastenings, etc., used in connection with lifeboat gear shall be designed with a minimum factor of safety of 6, based on the maximum working load.

Where mechanical means for lowering are required, not more than two-part falls shall be used, except in specific cases where three-part falls may be accepted.

Wire rope falls of 6 x 19 regular lay filler wire construction, prelubricated at the factory with suitable neutral wire rope lubricant, shall be accepted as standard. Any other type of wire superior or equally as good as the minimum standard specified may be used.

Falls shall be of such length that the lifeboat may be lowered to the water at the highest seagoing draft with the vessel listed to 15°.

Falls shall be in readiness for use at all times. On vessels over 1,000 gross tons, not fitted with mechanical means for lowering, covered tubs, boxes, or reels shall be provided for the stowage of falls, and suitable lowering bitts shall be fitted in easily accessible positions.

Where more than one lifeboat is served by the same set of davits, if the falls are of manila rope, separate falls shall be provided to serve each lifeboat.

Such blocks as are necessary to allow the falls to lead fair in all positions of the davit shall be fitted. Where mechanical means for lowering are provided, there shall be at least 8 feet between the center of the drum and the center of the nearest sheave. Sheaves for wire rope shall have a diameter at the base of the groove at least equal to 12 times the diameter of the rope.

There shall be ample clearance between the cheeks of blocks in which manila rope is used. The width between the cheeks shall be half an inch greater than the diameter of new ropes when those ropes are 3¼ inches in circumference or greater; blocks for smaller ropes shall be designed with clearance in the same proportion.

Means for lubrication shall be provided for all moving parts of blocks.

76.25 Care of lifeboats. Lifeboats shall be stripped, cleaned, thoroughly overhauled, and painted at least once in every year.

76.26 Tests of lifeboats at annual inspection. The inspectors shall satisfy themselves that every lifeboat, together with its equipment, of all vessels, is in every respect in good condition and ready for immediate use. Every lifeboat, with its required equipment, of passenger vessels, shall be lowered to near the water and loaded to its allowed capacity, evenly distributed throughout its length, and then lowered into the water afloat. In making this test, persons or deadweight may be used. If persons are used, the weight of each person shall average at least 140 pounds. When deadweight is used, the weight shall be equivalent to at least 140 pounds for each person allowed.

76.28 Inclosed lifeboats. All steamers carrying passengers shall be equipped with at least one lifeboat of approved open standard type. Where two lifeboats are required, one of the same may be of an approved inclosed type. Where three or more lifeboats are required, two of such lifeboats shall be of approved open standard type, one to be carried on each side under davits. In no case shall the lifeboat equipment of any steamer consist of more than 50 percent of approved lifeboats of inclosed type.

When the approved inclosed type of lifeboat is carried on steamers other than those carrying passengers, such steamers shall also be equipped with one lifeboat of approved open standard type of not less than 180 cubic feet capacity.

76 32 Life rafts. Drawings, specifications, name plates, and how marked (a) All life rafts shall be substantially constructed in accordance with drawings, or blueprints, and specifications approved by the Commandant

(b) Builders of life rafts shall furnish the Coast Guard District Commander of the district in which the life rafts are built drawings, or blueprints, and specifications, showing and explaining the construction of same and showing the tensile strength and ductility of the metal used Life rafts may be constructed of steel having a minimum tensile strength not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches, or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved metals Where steel is used and a minimum thickness of the metal is less than No 16 B W G, the elongation shall not be less than 15 percent in a gage length of 8 inches

(c) Builders of life rafts shall affix a plate or other device to each life raft, having thereon the builder's name, the manufacturer for whom approved, number of raft, date of construction of raft, cubical contents of raft, and number of persons said raft will carry, as determined by the rules of the Commandant

(d) There shall be stenciled in a conspicuous place on each life raft now in use the number of persons said raft can carry, as hereinafter provided

76.33 Inspection of life rafts when built Coast Guard District Commanders of districts where life rafts are built shall detail an inspector to any place where life rafts are being built, whose duty it shall be to carefully inspect and examine the construction of such life rafts, and he shall satisfy himself that such life rafts are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders When the inspector approves the construction of the raft he shall stamp his initials, together with the letters U S C G., on a blank space on the plate required to be affixed to the raft by the builder The initials of the inspector shall be satisfactory evidence to all parties interested that the raft has been constructed in accordance with the drawings, or blueprints, and specifications on file This section shall apply to all life rafts constructed after June 30, 1912

76 34 Construction of rafts of the catamaran type. All metal life-raft cylinders of more than 15 feet in length or of more than 16 inches in diameter shall be constructed of metal not less than No 18 B W G No life-raft cylinders shall be of less thickness of metal than No 20 B W G.

The retaining bands which secure the cylinders to the frames shall be made in halves, so that the cylinders may be detached without difficulty and without disassembling the body of the raft, for the purpose of inspection, cleaning, and painting, as required by § 76 36 Wooden guards and gunwales shall be secured to the retaining bands by angle-iron clips or by the jaws of the retaining bands Iron rods extending across the raft at top and bottom shall pass through the gunwale and its securing clips or jaws at each end of the raft The ends of the rods shall be properly secured with a screw nut inside and outside of the gunwale

All such cylinders shall be divided by watertight bulkheads into not less than three compartments of equal lengths Cylinders over 9 feet in length shall be divided into equal lengths by watertight bulkheads into not less than one compartment for every 3 feet of its length One of such bulkheads shall be at the extreme end of each cylinder or as near thereto as the flange of cone or bumped ends will permit Each compartment shall be provided with a suitable air-pump connection of one-half inch outside diameter, fitted with airtight cap

Only countersunk-headed rivets shall be used in the construction of metallic life rafts.

All seams and joints shall be properly double riveted or where welding is employed the welders shall be qualified by the Coast Guard

The above provisions of this section shall take effect only as to life rafts constructed after December 31, 1908

The circumferential as well as the longitudinal seams of life-raft cylinders shall be riveted and tightly calked, or securely hook-jointed and efficiently soldered, or properly and securely welded on rafts constructed after June 30, 1905. Such longitudinal seams shall be secured by not less than 12 rivets to each foot, circumferential seams by not less than 10 rivets to each foot, and bulkheads by not less than 8 rivets to each foot. Bulkhead flanges may be single riveted. The diameter of shank of rivets shall be not less than No. 10 B. W. G.

The framework connecting the cylinders of metallic life rafts shall be substantially built and capable of resisting the strain which tends to break the cylinders apart when the raft is broadside on in surf or seaway.

No type of raft may be approved unless it satisfies the following conditions:

It should be reversible.

It should be of such size, strength, and weight that it can be handled without mechanical appliances, and, if necessary, be thrown from the vessel's deck.

It shall have not less than 3 cubic feet of air cases or equivalent buoyancy and not less than 3 square feet of deck surface for each person allowed. Rafts already in use may have the rating changed by the Coast Guard District Commander of the district where the same are being used to meet these requirements and allowances.

The air tanks or equivalent buoyancy should be placed as near as possible to the sides of the raft.

At least one-half of the number of life rafts on all steam vessels shall have a capacity exceeding 15 persons.

Tule and all other types of catamaran life rafts shall meet the requirements specified in this section.

76.35 Tests of air tanks of life rafts. Before any life raft is passed and accepted, the air tanks thereof shall be tested in the presence of an inspector by an air pressure of not more than 1 pound to the square inch. At each subsequent annual inspection, or oftener, if in the opinion of the inspectors it is necessary or desirable, the inspectors shall satisfy themselves that the tanks are in good condition, but pressure need not be applied unless the inspectors are in doubt regarding the efficiency of the tanks. This does not take from the inspectors the right and authority to satisfy themselves at any time, either by examination or pressure, as to the condition of the tanks.

76.36 Care of life rafts. All life rafts shall be stripped, cleaned, painted, and thoroughly overhauled at least once in every year, and inspectors shall carefully examine at all inspections the material which supports the platform of all life floats in order to determine to their satisfaction that the strength is maintained. If it is found that deterioration has begun, it shall be corrected even to the extent of requiring the renewal of the platform-supporting device.

76.37 Approved life rafts. Any type of life rafts approved by the Commandant shall be considered as equivalent to the standard raft above specified.

76.48 Equipment for life rafts on vessels of classes (a), (b), (c), (d), and (e). All life rafts on vessels of classes (a), (b), (c), (d), and (e) shall be equipped as follows:

(a) **Boathook.** One boathook of clear-grained wood of suitable length but not less than 6 feet long by 1½ inches in diameter.

(b) **Distress signals.** Six approved hand red flare distress signals in a watertight container, or six approved hand combination flare and smoke distress signals in a watertight container. Service use shall be limited to a period of three years from date of manufacture. Distress signals not bearing date of manufacture shall not be carried after January 1, 1949. (For specifications for the above signals, see subparts 160.021, 160.022, and 160.023 in Subchapter Q of this chapter.)

² **NOTE.**—The specifications for distress signals are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the

manufacture of equipment, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows

160 021 Signals, Distress, Flare, Red, Hand (46 CFR Subpart 160 021)

160 022 Signals, Distress, Smoke, Orange, Floating (46 CFR Subpart 160 022)

160 023 Signals, Distress, Combination Flare and Smoke, Hand (46 CFR Subpart 160 023)

(c) **Life line** A life line properly secured entirely around the sides and ends of the life raft, festooned in bights not longer than 3 feet, with a seine float in each bight The life line shall be of a size and strength not less than 12-thread manila rope

(d) **Matches** One box of friction matches in a watertight container

(e) **Oars or paddles.** Four oars and one steering oar for all life rafts for seven persons and over The oars shall be of suitable size but not less than 8 feet in length Two paddles for all life rafts for six persons or less The paddles shall be of suitable size but not less than 5 feet in length

(f) **Painter.** One painter of manila rope not less than 2¼ inches in circumference and of a length not less than three times the distance between the boat deck and the light draft

(g) **Rowlocks.** On life rafts for seven persons and over, five rowlocks attached by separate chains in such a manner that they may be used from either side of the raft A becket may be substituted for the steering oar rowlock

(h) **Sea anchor.** One sea anchor constructed of good quality canvas or other satisfactory material, and, if of circular pattern, to be not less than 2 feet in diameter

(i) **Self-igniting water light** One self-igniting water light of approved type, as provided in § 76 54 of this part, attached to the life raft by a manila lanyard, of about 15-thread, 3 fathoms in length

(j) **Storm oil** One gallon of vegetable or animal oil in a container so constructed that the oil can be easily distributed on the water, and so arranged that it can be attached to the sea anchor

(k) **Stowage of equipment** All loose equipment shall be securely attached to the life raft to which it belongs

76 48a Equipment for life rafts on vessels of class (f). All life rafts on vessels of class (f) shall be equipped as follows

(a) **Boathook** One boathook of clear-grained wood of suitable length but not less than 6 feet long by 1½ inches in diameter

(b) **Life line** A life line properly secured entirely around the sides and ends of the life raft, festooned in bights not longer than 3 feet, with a seine float in each bight The life line shall be of a size and strength not less than 12-thread manila rope

(c) **Oars or paddles** Four oars and one steering oar for all life rafts for seven persons or over The oars shall be of suitable size but not less than 8 feet in length Two paddles for all life rafts for six persons or less The paddles shall be of a suitable size but not less than 5 feet in length

(d) **Painter** One painter of manila rope not less than 2¼ inches in circumference and of a length not less than three times the distance between the boat deck and the light draft

(e) **Rowlocks.** On life rafts for seven persons and over, five rowlocks attached by separate chains in such a manner that they may be used from either side of the raft. A becket may be substituted for the steering oar rowlock

(f) **Self-igniting water light** One self-igniting water light of approved type, as provided in § 76 54 of this part, attached to the life raft by a manila lanyard, of about 15-thread, 3 fathoms in length, required only on towing vessels of 300 gross tons and over

(g) **Stowage of equipment.** All loose equipment shall be securely attached to the life raft to which it belongs

76 48b Equipment for life floats All life floats shall be equipped as follows

(a) **Boathook** One boathook of clear-grained wood of suitable length but not less than 6 feet long by 1½ inches in diameter

(b) **Life line** A life line properly secured entirely around the sides and ends of the float, festooned in bights not longer than 3 feet, with a seine float in each bight The life line shall be of a size and strength not less than 12-thread manila rope

(c) **Paddles** Four paddles

(d) **Painter.** One painter of manila rope not less than 2¼ inches in circumference, and of a length not less than three times the distance between the boat deck and the light draft

(e) **Self-igniting water light** One self-igniting water light of approved type of the same character as required for life rafts, as provided in § 76 54 of this part, attached to the float by a manila lanyard, of about 15-thread, three fathoms in length

(f) **Stowage of equipment** The boathook and paddles shall be securely lashed on the sides of the life float to which they belong

76 49 Handling of the boats and rafts. All the boats and rafts shall be stowed in such a way that they can be launched in the shortest possible time and that, even under unfavorable conditions of list and trim from the point of view of the handling of the boats and rafts, it may be possible to embark in them as large a number of persons as possible The arrangements shall be such that it may be possible to launch on either side of the vessel as large a number of boats and rafts as possible Where practicable, lifeboat chocks shall be so fitted that the lifeboats they serve shall not require lifting before launching At least once in each interval of not longer than three months the master of every inspected passenger vessel shall drill and exercise every member of the crew, except females, in pulling oars in the ship's lifeboats In addition, the crew of the motor-propelled boats shall demonstrate their ability in the working of the engine and handling of the boat under power

76 50 Certificated lifeboatmen, manning of the boats There shall be for each boat or life raft a number of lifeboatmen at least equal to that specified in the following table

If the prescribed complement is—	The minimum number of certificated lifeboatmen shall be—
Less than 26 persons.....	1
From 26 to 40 persons.....	2
From 41 to 61 persons.....	3
From 62 to 85 persons.....	4
Above 85 persons.....	5

The allocation of the certificated lifeboatmen to each boat and raft remains within the discretion of the master, according to the circumstances.

By "certificated lifeboatman" is meant any member of the crew who holds a certificate of efficiency issued under the authority of the Commandant

In order to obtain the special lifeboatman's certificate the applicant shall prove to the satisfaction of an officer designated by the Commandant that he has been trained in all the operations connected with launching lifeboats and the use of oars, that he is acquainted with the practical handling of the boats themselves, and, further, that he is capable of understanding and answering the orders relative to lifeboat service

76.51 Manning of the boats A licensed officer or able seaman shall be placed in charge of each boat or pontoon raft, he shall have a list of its lifeboatmen, and other members of its crew which shall be sufficient for her safe management, and shall see that the men placed under his orders are acquainted with their several duties and stations *Provided*, That if the raft carries 15 persons or less a licensed officer or able seaman need not be placed in charge of such raft: *Provided, further*, That one-half the number of rafts carried shall have a capacity of exceeding 15 persons

A man capable of working the motor shall be assigned to each motorboat

The duty of seeing that the boats, pontoon rafts, and other lifesaving appliances are at all times ready for use shall be assigned to one or more officers

76 51a Buoyant apparatus—(a) Definition Buoyant apparatus is defined as buoyant deck seats, buoyant deck chairs, and life floats or other apparatus, having buoyancy, except lifeboats, life buoys, and life preservers, and no buoyant apparatus shall be approved which requires any adjustment or preparation

(b) General requirements Buoyant apparatus shall conform to the following general requirements

(1) Its construction shall be of material and workmanship adequate for the purpose intended

(2) It shall be effective and stable floating either side up

(3) It shall have a line securely becketed around the outside and/or pendants to accommodate the number of persons allowed

(4) It shall be of such size, strength, and weight as to be handled without mechanical appliances and thrown without damage from the deck where stowed

(5) Its weight shall in no case exceed 200 pounds

(6) It shall have air cases or equivalent buoyancy placed as near as possible to its sides

(c) Capacity (1) The number of persons for which any type of buoyant apparatus may be deemed suitable shall be determined, subject to the result of the stability test by the least of the numbers ascertained, as follows (i) Number of pounds of iron the apparatus is capable of supporting in fresh water, divided by 32, (u) the number of feet in the perimeter

(2) The divisor given in subparagraph (1) shall be required to be increased where the apparatus is designed so that persons supported are only partially immersed in the water, or where facilities are provided for climbing onto the top of it

(d) Stability Every type of buoyant apparatus shall be capable of supporting along any edge, without capsizing, a weight of iron 15 pounds per foot length suspended in the water from the life lines Where the length of the edge is 4 feet or less the minimum weight of iron suspended from any edge shall be 60 pounds

(e) Test for strength Every new type of buoyant apparatus shall be tested for strength by dropping a sample into the water from a height of 60 feet

(f) Air tanks—(1) Material. Where metal air tanks furnish the buoyancy of the apparatus, they shall be constructed of best-quality copper or yellow metal of not less than 18 ounces to the superficial foot All joints shall be securely hook-jointed and efficiently soldered, or properly and securely welded. Air tanks shall be fitted with suitable testing nipples, and when testing same an air pressure of not more than 1 pound to the square inch shall be used

(2) Size Air tanks shall be not more than 4 feet in length, but where more than 2 feet 6 inches in length or breadth they shall be efficiently stiffened by divisions or stays At no time shall the cases be pierced for the attachment of wood divisions or stays, nor for any other purpose

(3) Protection Air tanks shall not be placed in contact with metal ironwork, and they shall be protected from injury by properly fitted solid wood casing and secured against movement therein

(g) Name plate. Each piece of buoyant apparatus shall have a brass plate or its equivalent affixed thereon by the builder, and bearing his name and address, the words "Buoyant apparatus," the number of the apparatus, date of construction, dimensions, and number of persons allowed

(h) Factory inspection. Buoyant apparatus shall be examined at the factory by an inspector, who shall satisfy himself that it has been constructed in accordance with plans and

specifications on file in the office of the Coast Guard District Commander, after which he shall stamp the initials of his name, the letters U S C G, and the date on the name plate

76 52 Life preservers—(a) Number required. All vessels shall be provided with one approved life preserver for each person carried. Passenger vessels shall be provided with an additional number suitable for children equal to at least 10 percent of the total number of persons carried

(b) Distribution, stowage, and notices. (1) Life preservers, including those especially provided for children, shall be properly distributed throughout the staterooms, berthings, and other places convenient for passengers and crew

(2) Lockers, boxes, and closets in which life preservers are stowed shall be plainly marked, and the life preservers contained therein shall be readily available

(3) Life preservers stowed overhead shall be so supported that they can be quickly released and distributed among passengers. Where life preservers are stowed overhead at a height greater than 7 feet from the deck below, efficient means shall be provided for their immediate release and distribution, to be operated by persons standing on the deck

(4) A printed notice shall be posted in every cabin and stateroom and in conspicuous places about the deck, informing passengers of the location of the life preservers and describing and illustrating the method of applying or adjusting them

(e) (Canceled)

NOTE—The specifications for buoyant materials have been revised and transferred to Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations. These specifications have not been reprinted herein but may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C., and are identified as follows

- 164 001 Cork, Sheet (46 CFR Subpart 164 001)
- 164 002 Balsa Wood (46 CFR Subpart 164 002)
- 164 003 Kapok, Processed (46 CFR Subpart 164 003)

(f) Specifications for standard type block-cork life preserver—(1) Type. The type shall conform to Figure 1, and shall be reversible and vestlike, with recesses under arms to allow front and back sections to fit around the upper part of the wearer and held in place by straps, the whole to be of such construction and character as to support the wearer in an upright or slightly backward position. Children's life preservers are to be of the same general form and construction and conform in every respect, as regards material and design, to the standard approved adult life preserver with the exception that the size is to be reduced one-third.

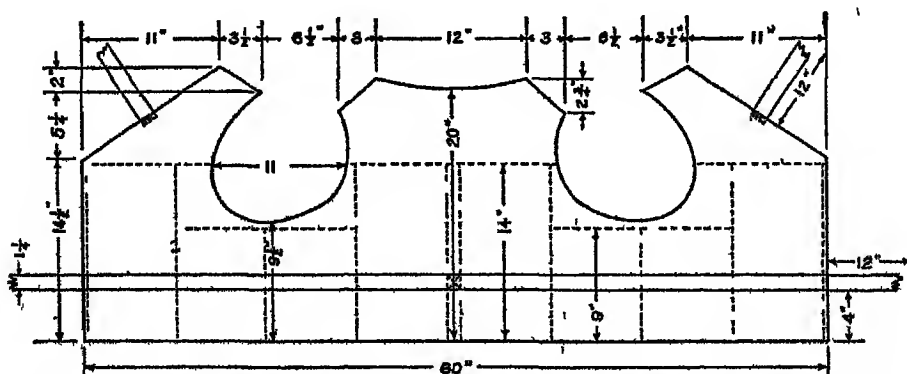


FIGURE 1—Approximate dimensions of a standard type cork and balsa wood life preserver cutting pattern
Dotted lines indicate stitching

(2) **Buoyant material.** It shall contain eight blocks of cork of the following approximate dimensions Four blocks 11 by 5 by 1½ inches and 4 blocks 6 by 5 by 1½ inches The corners and edges of the blocks shall be slightly rounded or beveled The weight of the finished cork in each life preserver shall be not less than 4 pounds and not more than 4 5 pounds

(3) **Buoyancy test** The life preserver shall be submerged in a tank of fresh water for a period of 48 hours The adult life preserver shall then support in fresh water a net weight of 16½ pounds or 11 pounds for children's type

(4) **Cover** The cover shall be of unbleached, uncolored drill or twill, without filling or sizing, weighing not less than 7 2 ounces to the square yard It shall be in not more than two pieces, one piece for either side

(5) **Marking** Each life preserver shall be plainly marked on the front compartment with either the word "Adults" or the word "Children" as the case may be It shall also be plainly stenciled with the name and address of the manufacturer and with the official approval number assigned to the life preserver

(6) **Smooth surface** The outside surface, edges, and corners of the buoyant material shall be of such smoothness as will prevent undue destruction of the covering material and present a suitable smooth surface for legible stenciling and stamping by inspectors

(7) **Stitching** All seams and other machine sewing shall be made with a short lock stitch with not less than eight stitches to the inch The lower longitudinal edge of the covering seam shall be turned to a roll and closely rope stitched or it may be machine sewn with a short lock stitch with not less than 8 stitches to the inch

(8) **Straps** The straps shall have a tensile strength of at least 175 pounds and shall be of double-woven cotton tape 1½ inches in width having selvage or cord edges One strap on each side secured by double stitching and extending 12 inches beyond the end of the life preserver, and two neck straps 12 inches in length All straps are to be sewn to the body of the life preserver by double stitching

(9) **Thread** The thread shall be of a size and strength not less than Barbour's linen, three-cord, No 25 machine thread Any thread other than of linen shall require the approval of the Commandant

(g) **Specifications for standard type balsa-wood life preserver—(1) Type** This shall be the same as for cork as provided in § 76 52 (f) (1)

(2) **Buoyant material** It shall contain eight blocks of balsa wood of the following approximate dimensions four blocks 11 inches by 5 inches by 1½ inches and four blocks 6 inches by 5 inches by 1½ inches The corners or edges of the blocks shall be slightly rounded or beveled The weight of the finished balsa wood used in each life preserver shall not be less than 2½ pounds nor more than 3 pounds

(3) **Buoyancy test** This shall be the same as provided in § 76 52 (f) (3)

(4) **Cover** This shall be the same as provided in § 76 52 (f) (4)

(5) **Marking** This shall be the same as provided in § 76 52 (f) (5)

(6) **Smooth surface.** This shall be the same as provided in § 76 52 (f) (6)

(7) **Stitching** This shall be the same as provided in § 76 52 (f) (7)

(8) **Straps** This shall be the same as provided in § 76 52 (f) (8)

(9) **Thread** This shall be the same as provided in § 76 52 (f) (9)

(h) (Canceled.)

NOTE.—The specifications for the standard type kapok life preservers are contained in a separate pamphlet entitled "Life Preservers, Kapok, Adult and Child," and may be obtained from the Commandant (MMT), U S Coast Guard, Washington 25, D C.

(i) **Factory inspection.** An inspector shall examine all life preservers at the place of manufacture. After satisfying himself that they have been manufactured according to the

requirements of these rules, he shall select indiscriminately from each lot of 250 at least one life preserver to be tested for buoyancy

Where such life preservers are found to conform to all the requirements of these rules, the inspector shall stamp them with the word "Approved," the initials of his name, the date of examination, and location of his local office

(j) **Shipboard inspections** At each annual inspection of any vessel, or oftener if deemed necessary, the life preservers shall be examined by an inspector to determine serviceability. When life preservers are found to be in accordance with the requirements, the inspector shall stamp them with the word "Passed", his initials, port, and date. Life preservers found not to be in a serviceable condition shall be removed from the vessel's equipment and, if beyond repair, shall be destroyed in the presence of the inspector

(k) Manufacturer's affidavit

AFFIDAVIT OF MANUFACTURER OF STANDARD TYPE LIFE PRESERVERS

State of _____

County of _____

On this _____ day of _____, 19____, I, the undersigned, _____

_____ hereby certify that I am the _____

(Name)

(Title)

of the _____ located at _____, that

(Name of company)

I am authorized to make this affidavit, and that the standard type _____

(See Note 1)

life preservers of our manufacture furnished directly or through agents or dealers for use on vessels subject to the jurisdiction of the United States Coast Guard, comply with the applicable provisions of the regulations prescribed

(Signature) _____

Subscribed and _____ to before me this _____ day of _____

(Sworn or Affirmed)

19____

(Signature) _____

[SEAL]

Notary Public

NOTE 1 — Indicate adult or child size and name or description of buoyant material.

76.53 Life buoys—(a) Number required. (1) The minimum number of approved 30-inch life buoys and the minimum number to which approved water lights shall be attached shall be in accordance with the following table

Length of vessel	Minimum number of approved 30 inch life buoys	Minimum number of approved 80 inch life buoys with approved water lights attached	Length of vessel	Minimum number of approved 30-inch life buoys	Minimum number of approved 80-inch life buoys with approved water lights attached
Under 100 feet	2	0	400 feet and under 600 feet	18	9
100 feet and under 200 feet	4	2	600 feet and under 800 feet	24	12
200 feet and under 300 feet	6	2	800 feet and over	30	15
300 feet and under 400 feet	12	4			

(2) One life buoy on each side of a vessel shall have an attached line at least 15 fathoms in length

(b) **Distribution and securing of life buoys and water lights.** All life buoys and water lights shall be distributed and secured as follows

(1) All life buoys shall be so placed as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to the persons concerned

(2) The life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way

NOTE.—The specifications for life buoys are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the manufacture of ring buoys, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows

- 160 009 Buoys, Life, Ring, Cork and Balsa Wood (46 CFR Subpart 160 009)
- 164 001 Cork, Sheet (46 CFR Subpart 164 001)
- 164 002 Balsa Wood (46 CFR Subpart 164 002)

76 54 Self-igniting water lights The self-igniting water lights for ring buoys and life rafts shall consist of a cylinder (with bumped heads or ends) made of good sheet copper of not less than 0 022 inch thick, and shall be so designed as to be nonexplosive, and shall be free from any defects which may affect the serviceability or operation of the light. The cylinder shall be sufficiently weighted in the bottom to recover and maintain an upright position in the water, and all circumferential and horizontal seams of the cylinder shall be hook-jointed and soldered, and the top circumferential seam shall be flush, so as to prevent the lodgment of water.

The cylinder shall be provided with a plug or other device of such character that when removed from the cylinder sufficient water will be admitted to insure the prompt and efficient action of the light, regardless of whether the cylinder when first striking the water becomes completely submerged.

The removal of the plug or device shall be effected by the operation of a lanyard attached to the buoy and to the plug or device on the cylinder, and shall be so arranged and constructed that the weight of the buoy when thrown overboard will automatically disengage the plug or device, and will insure that the light will self-ignite within one minute after reaching the surface of the water.

The cylinder shall contain calcium carbide (taken from fresh stock entirely free from the white powdery substance resulting from exposure to the air) and calcium phosphide sufficient to create a brilliant flame of at least 150 candlepower, which shall be maintained and burn for a continuous period of not less than 45 minutes without emitting obnoxious fumes. If at any time during this period the flame is extinguished, due to the total submersion of the light, the light shall self-ignite upon coming to the surface.

The self-igniting water lights required for life rafts shall meet the above requirements, except that the plug or device may be removed by manual action instead of by automatic action of the buoy lanyard above referred to.

The cylinder shall be plainly marked with the word "Top" at its top end and permanently indented or embossed with the name and address of the manufacturer, the year of manufacture (the use of labels of any description for this purpose is strictly forbidden), and with the statement that the device meets in every way the requirements of the Commandant.

On and after July 1, 1924, no type or make of water light will be approved which has not been tested by the Bureau of Standards, Department of Commerce, and found to conform in all respects to the requirements in this part.

76 56 Steering apparatus (a) Extra steering apparatus consisting of relieving tackle, or of auxiliary power or hand steering gear attached to the rudder stock independent of the regular steering gear shall be provided.

(b) Where reasonable and practicable, the emergency steering wheel shall be located on the after weather deck, and an efficient means of communication shall be provided between the pilothouse, the emergency steering station, and the steering engine room.

(c) The following requirements relative to the arrangement of steering stations are applicable to new installations and replacement of existing installations on all classes of vessels.

(1) Steering wheels in or at steering stations shall be installed in a vertical position and arranged for steering by the helmsman when standing abaft the wheel and facing forward. The top of the steering wheel, the rudder blades, and the head of the ship shall move in the same direction.

(2) When a "trick" wheel is installed in the steering gear room and is used for warming up and testing the gear, and also for steering purposes, this wheel shall be arranged as follows:

(1) If the "trick" wheel is installed in a vertical position it shall meet all requirements outlined in subparagraph 1.

(11) If the "trick" wheel is installed in a horizontal position it shall turn in a clockwise direction for "right rudder" and in a counterclockwise direction for "left rudder." With this arrangement, the helmsman need not stand abaft the wheel.

(3) Where "trick" wheel or other device is installed in the steering gear room for the sole purpose of warming up and testing the gear, it may be installed to best suit design and operating conditions of the gear. A plate shall be fitted on this wheel or device with indicating arrows showing the direction of movement to produce "right rudder" and "left rudder."

(4) When auxiliary steering gear is installed in lieu of relieving tackles, the steering wheel or device used for operating the gear shall meet all requirements outlined in subparagraph (c) (1) of this section.

(5) At all steering stations, there shall be installed a suitable notice on the wheel or device, or in such other position as to be directly in the helmsman's line of vision, to indicate the direction in which the wheel or device must be turned for "right rudder" and for "left rudder."

(d) Where no regular rudder is fitted and steering action is obtained by a change of setting of the propeller unit, the requirements of paragraphs (a), (b) and (c) will not generally be applicable, and special consideration will be given.

76 56a Embarkation aids—(a) Ladders. Vessels carrying passengers shall be provided with suitable ladders to enable passengers to descend to lifeboats and life rafts, one such ladder being provided for each set of boat davits. These ladders shall be kept ready and convenient for use on the lifeboat deck, and shall reach from such deck to the vessel's light water line. They shall be reversible and free from garment-entangling projections.

(b) **Illumination for boat-launching operations.** (1) Provision shall be made on all passenger vessels, where the boat deck is more than 30 feet above the water line at the lightest seagoing draft, for readily and continuously available illumination from the vessel of lifeboats when alongside and in process of or immediately after being launched. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system and placed in the upper part of the vessel above the bulkhead deck.

(2) The emergency generating set will ordinarily provide a satisfactory source of illumination, and, where used for this purpose, it shall be of sufficient power to provide for such illumination in addition to other demands made upon the set.

76 57 Bulkheads. Every mechanically propelled vessel of more than 75 gross tons carrying passengers for hire shall have a sufficient number of iron or steel transverse watertight bulkheads so that the vessel will remain afloat and have positive stability in the event any one main compartment is flooded.

A forepeak or collision bulkhead shall be fitted and located not less than 5 percent of the length of the ship, and not more than 10 feet plus 5 percent of the length of the ship from the bow, at load water line.

One bulkhead shall be fitted at the forward end of the machinery space (which includes boiler space) and one bulkhead shall be fitted at the aft end of the machinery space. Other transverse bulkheads shall be so located as to meet the above requirements of subdivision and stability.

Main transverse bulkheads shall not be stepped, but may be recessed. No recess shall be fitted nearer the vessel's side than one-fifth of the vessel's beam amidships measured at right angles to the center line at the level of the load water line on which the subdivision is based. Bulkheads shall extend to a deck whose distance above the load water line is sufficient to enable the subdivision and stability requirements to be met with a fair margin of safety.

If the distance between two adjacent main transverse watertight bulkheads is less than 10 feet plus 2 percent of the vessel's length measured between perpendiculars at the extremities of the vessel's load water line, only one of these bulkheads shall be regarded as forming a boundary of a main compartment.

76.58 Means of escape from steam vessels. On all steamers where the plans and arrangements will possibly permit, all inclosures where passengers or crews may be quartered, or where anyone may be employed, shall be provided with not less than two avenues of escape, so located that if one of such avenues is not available another may be.

Every steam vessel shall be provided with sufficient means of escape from the lower to the upper deck, or vice versa, and every steamer of 50 tons or over carrying passengers shall be provided with permanent stairways forward and aft, except where said stairways on towing boats would interfere with towing bitts.

Airports 16 inches or more in diameter in the hull of all passenger vessels that open into the passageways shall have a life line securely fastened overhead within the passageway. This life line shall be not less than 2 inches in circumference, knotted every 3 feet and of sufficient length to reach the water at the lightest seagoing draft.

76 58a Storm shutters, means of escape from boilerhouse to engine room. Steam vessels navigating the waters of the Great Lakes, so constructed as to have deck houses on the main or spar deck and exposed to the sea, shall be provided with storm shutters for the windows. Where the doors of such deck houses are not constructed of steel or iron plate, or of wood having a thickness of not less than 2 inches, the doors shall be provided with storm doors or shutters. Where the boilerhouse is located on the main or spar deck and exposed to the sea, an avenue of escape shall be provided from the boilerhouse to the engine room or through the top of the boilerhouse with the necessary ladders and scuttle, thereby enabling the boilerhouse doors to be kept closed during heavy weather.

76 60 Distress signals in pilothouse or on navigator's bridge. On every inspected vessel of 150 gross tons and over, there shall be carried within the pilothouse or upon the navigator's bridge, twelve approved hand red flare distress signals in watertight container, or twelve approved hand combination flare and smoke distress signals in a watertight container. Service use shall be limited to a period of three years from date of manufacture. Distress signals not bearing date of manufacture shall not be carried after January 1, 1949. (For specifications for the above signals, see subparts 160 021, 160 022, and 160 023 in Subchapter Q of this chapter.)

NOTE—The specifications for distress signals are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the manufacture of equipment, copies may be obtained upon request from the Commandant (MMT), U. S. Coast Guard, Washington 25, D. C., and are identified as follows:

160 021 Signals, Distress, Flare, Red, Hand (46 CFR Subpart 160 021)

160 022 Signals, Distress, Smoke, Orange, Floating (46 CFR Subpart 160 022)

160 023 Signals, Distress, Combination Flare and Smoke, Hand (46 CFR Subpart 160 023)

76 61 Vessel's name on equipment. All the equipments of a vessel, such as buckets, hose, axes, boats, oars, rafts, life preservers, floats, barrels, and tanks, shall be painted or branded with the name of the vessel upon which they are used.

76.62 Disengaging apparatus. Lifeboats shall be fitted with suitable disengaging apparatus. Mechanical disengaging apparatus shall be of a type approved by the Commandant. Excluding the emergency boats, not more than one type of releasing gear shall be fitted in the lifeboats of a particular vessel.

PART 77—FIRE APPARATUS, FIRE PREVENTION

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CROSS REFERENCE

Definition of terms See § 76 01

Section 77 01 Basis and purpose of regulations By virtue of the authority vested in the Commandant of the Coast Guard under section 101 of the Reorganization Plan No 3 of 1946 (11 F R 7875), R S 4405, 4426, 4470, 4471, 4477, and 4479, as amended, Act of June 20, 1936, section 2 of Act of October 9, 1940, and section 5 (e) of Act of June 6, 1941 (46 U S C 367, 375, 404, 463, 463a, 464, 471, 472, 50 U S C 1275), the regulations in this part are prescribed to provide adequate means for detecting, preventing, or fighting of fires on board vessels subject to these regulations in accordance with the intent of the various statutes on fire apparatus or fire prevention and to obtain their correct and uniform administration

77.1 Fire axes All steamers navigating the Great Lakes are required to be provided with axes, as follows

Gross tons	Axes
All steamers not over 10 tons.....	1
All steamers over 10 tons and not over 50 tons.....	1
All steamers over 50 tons and not over 200 tons.....	2
All steamers over 200 tons and not over 500 tons.....	4
All steamers over 500 tons and not over 1,000 tons.....	6
All steamers over 1,000 tons.....	8

77 2 Location of axes. All axes shall be located so as to be readily found in time of need, shall not be used for general purposes, and shall be kept in good condition

77.3 Glass lamps The use of glass lamps shall be prohibited on any vessel under the jurisdiction of the Coast Guard unless the same are securely fitted into suitable metal brackets,

77 4 Steam and inert-gas fire-extinguishing systems—(a) General requirements. (1) All mechanically propelled vessels carrying combustible cargo in the holds, 'tween-decks, or other closed cargo compartments, except those engaged exclusively in the carriage of coal in bulk, shall be equipped with means for extinguishing fire in such compartments by the use of a steam fire-extinguishing system or by the use of any inert-gas fire-extinguishing system approved by the Commandant

(2) Cabinets, boxes, or casings inclosing manifolds or valves shall be distinctly marked in painted letters, about 3 inches in height, "Steam Fire Apparatus" or "CO₂ Fire Apparatus," as the case may be

(3) Steam or gas piping fitted for extinguishing fire shall not be used for any other purpose except that it may be used for fire-detecting purposes

(4) Pipes for conveying steam from the boilers for the purpose of extinguishing fire shall not be led into the cabins, other passengers' or crew's quarters, or working spaces. Pipes for conveying carbon dioxide or other extinguishing vapors for the purpose of extinguishing fire shall not be led into the cabins or other passengers' or crew's quarters

(5) Steam smothering lines shall be tested with at least 50 pounds air pressure with ends of the smothering lines capped, or by blowing steam through the lines, and a survey made for detecting corrosion and defects, using the hammer test or such other means as may be necessary

(6) At annual inspections, all carbon dioxide (CO₂) cylinders, whether fixed or portable, shall be examined externally and replaced if excessive corrosion is found, and all cylinders shall also be checked by weighing to determine contents and if found to be more than 10 percent under required contents of carbon dioxide, the same shall be recharged

(b) Steam systems on mechanically propelled vessels contracted for prior to July 1, 1935. (1) The main pipes and their branches, on mechanically propelled vessels carrying passengers or freight, to convey steam from the boilers to the hold and separate compartments of the same shall be not less than 1½ inches in diameter. Steam pipes of not less than three-fourths of an inch in diameter shall be led into all lamp lockers, oil rooms, and like compartments, which lamp lockers, oil rooms, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal

(2) All branch pipes leading into the several compartments of the hold of the vessel shall be supplied with valves, the handles distinctly marked to indicate the compartment or parts of the vessel to which they lead. These valves or their handles shall be placed in not more than two places on the most suitable and accessible deck of the vessel and so arranged that all can be inclosed in cabinets, boxes, or casings

(c) Steam systems on mechanically propelled vessels contracted for on or after July 1, 1935. (1) Steam for fire-extinguishing systems shall be available from the main boilers or from a donkey or auxiliary boiler having a minimum capacity equivalent to one square foot of heating surface for each 300 cubic feet of the largest compartment in which cargo is carried. This requirement shall be based upon a rate of evaporation of 6 pounds of steam per hour per square foot of heating surface from and at 212° F medium steaming. Equivalent values of heating surface will be permitted for boilers having rates of evaporation differing from that herein specified

(2) The minimum boiler capacity shall be based upon the volume of the largest compartment in cubic feet, which shall be determined by measurements taken between fire-retarding boundaries such as decks having hatch covers with proper battening down arrangements, shells, tank tops, watertight and fire-retarding bulkheads

(3) A steam pressure of at least 100 pounds per square inch shall be maintained for fire-extinguishing purposes. Where the maximum allowable boiler working pressure will not permit of this, the maximum steam pressure permitted by the operating boiler pressure limitations shall be provided for this purpose

(4) The pipe lines shall be led from not more than three stations in easily accessible locations on the weather deck to each cargo hold, cargo 'tween-decks, or other closed cargo compartments, and to each cargo-oil deep tank, lamp locker, oil room, and like compartments, which lamp locker, oil room, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal. The steam connections to the lamp lockers, oil rooms, and like compartments may be taken from the nearest steam supply line, independent of

the extinguishing manifolds. In lamp lockers, oil rooms, and like compartments, adequate means may be provided for ventilation if suitable dampers capable of being operated from outside the spaces are fitted in each vent duct.

(5) Each pipe in the extinguishing manifolds shall be fitted with a shut-off valve plainly and permanently marked to indicate into which compartment it discharges. This requirement also applies to independent extinguishing lines.

(6) Manifold steam supply pipes shall be fitted with master valves at the manifolds, and provision shall be made for draining the manifold and individual lines to protect them against freezing. If the manifolds are located on an open deck, they shall be inclosed in a metal box.

(7) The minimum diameter of any steam fire-extinguishing pipe to a cargo hold, cargo 'tween-decks, other closed cargo compartments, or cargo-oil deep tank shall be 1 inch, the size and number of pipes to be governed by the size of the compartment. The minimum diameter of any steam fire-extinguishing pipe to a lamp locker, oil room, or like compartments, shall be three-fourths of an inch.

(8) The required diameter of pipe to cargo compartments may be determined by the formula

$$D = \sqrt{\frac{C}{30,000}}$$

where

D =required diameter of pipe, in inches

C =volume of compartment, in cubic feet

or by the following table

Volume of compartment	Number of branches to compartment	Size of branches	Volume of compartment	Number of branches to compartment	Size of branches
		Inches			Inches
30,000 - - - - -	1	1	94,000 - - - - -	2	1 1/4
46,000 - - - - -	1	1 1/4	135,000 - - - - -	2	1 1/2
67,000 - - - - -	1	1 1/2	203,000 - - - - -	3	1 1/2

(9) The diameter of the main supply line to the manifolds shall be computed by the following formula:

$$D = \sqrt{\frac{C}{60,000}}$$

where

D =diameter of pipe required, in inches

C =volume of all compartments, in cubic feet

(d) Inert-gas systems on mechanically propelled vessels. (1) When a carbon dioxide (CO₂) smothering system is fitted in the cargo hold, cargo 'tween-decks, or other closed cargo compartments, or cargo-oil deep tanks, the quantity of carbon dioxide shall be sufficient to give a gas saturation of 30 percent of the gross volume of the largest cargo hold. The quantity in pounds of carbon dioxide required may be determined approximately by the following formula

$$W = \frac{L \times B \times D}{80}$$

where

W =the weight of CO₂ required, in pounds.

L =the length of the hold, in feet,

B =the mean breadth of the hold, in feet

D =the depth from tank top or flat forming lower boundary to top of uppermost space in which freight may be carried, in feet.

(2) When a carbon dioxide (CO₂) smothering system is fitted in the lamp locker, oil room, or like compartments, the quantity in pounds of carbon dioxide required may be determined by dividing the gross volume of the space by a factor of 22. Lamp lockers, oil rooms, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal. The whole charge of gas shall be capable of being released simultaneously by operating one valve and control, and all cylinders shall be completely discharged in not more than 2 minutes.

(3) Pipes used for supplying carbon dioxide to the cargo holds, cargo 'tween-decks, other closed cargo compartments, and cargo-oil deep tanks shall be not less than three-fourths inch inside diameter. Pipes used for supplying carbon dioxide to lamp lockers, oil rooms, and like compartments shall not be less than one-half inch inside diameter.

(4) The control(s) releasing the inert gas shall be located in a position(s) outside the space(s) protected and shall be readily accessible when the vessel is being navigated. All valves shall be permanently marked to indicate into which compartment they discharge.

(5) Provisions shall be made to prevent the admission of air into the lower parts of cargo holds, cargo 'tween-decks, and other closed cargo compartments while the inert-gas system is in operation.

(6) Cylinders, piping, and controls for the inert-gas system shall be protected from damage and shall be securely fastened and supported.

77.5 Steam fire pumps or their equivalent—(a) Fire pumps on steam vessels contracted for prior to July 1, 1935. (1) Steam vessels required to be provided with double-acting steam fire pumps or other equivalents for throwing water shall be equipped with such pumps according to their tonnage, as follows: Steam vessels over 20 gross tons and not exceeding 150 gross tons shall have not less than 50 cubic inches pump-cylinder capacity. Steam vessels of over 150 gross tons and under 3,000 gross tons shall have not less than one-third of 1 cubic inch pump-cylinder capacity for every gross ton. Steam vessels of 3,000 gross tons and over shall have pump-cylinder capacity of not less than 1,000 cubic inches. This rule shall apply only to pumps installed after June 30, 1907, and all pumps now approved and in use or installed before said date shall be accepted if complying with requirements of law and regulations in force at the time of their installation.

(2) On steam vessels required by paragraph (a) (1) above to have steam fire pumps or their equivalents, the fire mains shall be led from the pumps to all decks, with sufficient number of outlets arranged so that any part of the steam vessel can be reached with water with the full capacity of the pumps and by means of a single 50-foot length of hose from at least one of said outlets. On all classes of steam vessels every such pump shall be fitted with a gage and a relief valve of such size as to restrict the pressure of water to 100 pounds per square inch.

(b) Fire pumps on steam vessels contracted for on or after July 1, 1935. (1) Passenger vessels of 100 gross tons and under shall be equipped with one hand fire pump with a pump-cylinder capacity not less than 100 cubic inches, or a power-driven pump of equivalent discharge capacity.

(2) Vessels exceeding 100 gross tons shall be equipped with fire pumps and fire piping as follows:

(i) All vessels shall be provided with powerful pumps available for use as fire pumps. Passenger vessels of less than 4,000 gross tons shall have two, and larger passenger vessels at least three independently driven pumps connected to the fire main. Cargo vessels and towing vessels of less than 1,000 gross tons shall have one, and larger cargo or towing vessels at least two such pumps so arranged. Each pump shall be capable of delivering two powerful jets of water simultaneously from the highest outlets on the fire main at a Pitot tube pressure of approximately 50 pounds per square inch through nozzles, each having an orifice of not less than ¾-inch diameter where the internal diameter of the hose exceeds

1½ inches and not less than ¾ inch in diameter where the internal diameter of the hose does not exceed 1½ inches

(ii) On oil-burning passenger vessels, where two or more pumps are required, they shall not all be located in the same compartment. Where the engine and fire rooms are not entirely separated by steel bulkheads, or if fuel oil can drain from the fire room bilges into the engine room, one of the fire pumps shall be located in an accessible space in a separate compartment.

(iii) On oil-burning cargo vessels, where two pumps are required, they may be located in the same compartment, provided the compartment is equipped with an approved fixed carbon dioxide extinguishing system.

(3) Outlets from the fire mains shall be of a sufficient number and so arranged that any part of the living quarters, weather decks, and any part of cargo decks accessible to crew or passengers, while the vessel is being navigated, may be reached with a single 50-foot length of hose. Outlets within accommodations and service spaces adjacent thereto shall comply with the above or they may be so arranged that any part may be reached with a single 75-foot length of hose provided a siamese connection is fitted at each outlet. Where the fire main is located on an exposed deck, branches shall be provided so that the hose connections necessary to comply with the foregoing be distributed on both sides of the vessel. The fire hose shall be connected to the outlet at all times, except on open decks where the location of the fire hydrants is such that no protection is afforded for the hose in heavy weather. The fire hose may be temporarily removed from the hydrant when it will interfere with the handling of cargo.

(4) Outlet openings shall have a diameter of not less than 1½" and shall be fitted with suitable hose connections and spanners. The arrangement of the fire hydrant shall be limited to any position from the horizontal to the vertical pointing downward, so that the hose will lead downward or horizontally, in order to minimize the possibility of kinking. In no case will a hydrant arranged in a vertical position with the outlet pointing upward be accepted.

(5) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 pounds higher than the pressure necessary to maintain the requirements of paragraph (b) (2) (i) above, and a pressure gage to indicate the pressure on the fire main. If the fire pumps operating under shut-off conditions are not capable of producing a pressure exceeding 125 pounds per square inch, the relief valve may be omitted.

(6) Fire hose shall not be used for any other purpose than fire extinguishing.

77.6 Dimensions of fire pumps, spanners. Steamers are not restricted to any particular proportions for fire pumps. Any dimensions that will attain the requirements specified in § 77.5, or greater in capacity, may be allowed. *Provided, however,* That all hydrant connections be supplied with suitable spanners.

77.7 Capacity of pipes and hose. The capacity of the pipes and hose leading from the pumps shall in no case be less than that of the discharge opening of the pump. *Provided, however,* That the pipes and hose shall in no instance be less than 1½ inches in internal diameter.

And provided further, That steamers of 15 tons and under may be allowed to use hose of three-fourths of an inch internal diameter, but in no case shall it be less than the discharge opening of the pumps.

77.8 Rotary pumps. A rotary pump, when driven by an engine independent of the main engine, may be considered as an equivalent for the double-acting fire pump and used as such when equal to it in efficiency and capacity.

77.9 Boiler-testing pumps. Any steamer having on board an independent steam pump and an auxiliary boiler suitably arranged and of sufficient strength and capacity for testing the boilers thereof, or if one of the hand fire pumps be suitably arranged and of sufficient strength and capacity for testing the boilers, or if the "doctor," so-called, when

arranged permanently for testing the boilers, is, in the judgment of the inspectors, suitable for the purposes intended, may be considered as having complied with the law requiring a pump for testing boilers

77 10 "Doctor " Any steamer of 50 gross tons or under, required to have a double-acting steam fire pump, and having in use on board a "doctor," so-called, may be considered as having a lawful equivalent for such a pump when such "doctor" has pipes attached to it leading to the upper and between decks, such pipes being provided with hose and valves, according to law, but the pipes and hose shall in no case be less than 1½ inches in internal diameter. The pumps supplying the boilers shall in no case be considered as an equivalent for the double-acting steam fire pump, on steamers above 50 gross tons

77 11 Connecting, bilge, and sounding pipes, hose tests All steam fire pumps required shall be supplied with connecting pipes leading to the hold of the vessel with stop-cocks or shut-off valves attached and so arranged that such pumps may be used for pumping and discharging water overboard from the hold

Each and every steam vessel shall be fitted with a bilge pipe leading from each compartment of the vessel and connecting with a suitably marked valve to the main bilge pump in the engine room, and each compartment of all steam vessels shall be fitted with suitable sounding pipe, the opening of which shall be accessible at all times, except that in compartments accessible at all times for examination no sounding tubes are necessary

Steam siphons may be substituted in each compartment for the bilge pipes

All hose required on steam vessels for fire purposes shall be tested to a pressure of 100 pounds to the square inch at each inspection, and it shall be the duty of the Officer in Charge, Marine Inspection, at each annual inspection to see that the couplings are securely fastened to the hose by suitable external or internal clamps, and at least one length of such hose shall be kept at all times attached to each outlet of the fire main and provided with a suitable nozzle. *Provided*, That on freight steamers where the keeping of such hose coupled on interferes with the loading or unloading of cargo they may be removed during such loading or unloading

77.12 Fire mains and hose connections All pipes used as mains for conducting water from fire pumps on steam vessels in place of hose shall be of steel, wrought iron, brass, or copper with wrought iron, brass, or composition hose connections

77 12a Pumps on motor vessels. Motor vessels of fifty gross tons and over carrying passengers for hire shall be equipped with pumps for throwing water according to the tonnage as described in § 61 5 for steam vessels and equipped as prescribed in §§ 61 5 to 61 7, inclusive, as they now exist or may hereafter be amended

77.13 Portable fire extinguishers. All vessels carrying passengers, including pleasure vessels, shall be provided with such number of good and efficient portable fire extinguishers, approved by the Commandant as is hereafter prescribed, viz

Vessels less than 150 feet in length shall have at least two fire extinguishers on each passenger deck; vessels 150 feet and over in length shall be provided with at least one fire extinguisher for every 150 linear feet of corridor length or fraction thereof, in the spaces occupied by passengers and crew. In all public spaces extinguishers shall be located not more than 150 feet apart

Freight and towing vessels shall be provided with chemical fire extinguishers as hereafter described, viz

	<i>Minimum number of fire extinguishers</i>
Vessels of over 15 and not over 50 gross tons.....	1
Vessels of over 50 and not over 100 gross tons.....	2
Vessels of over 100 and not over 500 gross tons.....	3
Vessels of over 500 and not over 1,000 gross tons.....	6
Vessels of over 1,000 gross tons.....	8

The above tables of required fire extinguishers are based on the capacity of the ordinary machine, which is about 2½ gallons, and no fire extinguishers of larger capacity shall be allowed a greater rating than that of the ordinary machine. Fire extinguishers of approved types of less capacity are allowable under the above tables when their total contents equal the required quantity.

All vessels carrying passengers, which transport automobiles or motor vehicles, the motive power of which is generated by any of the products of petroleum or other inflammable liquids, shall carry, in addition to the chemical fire extinguishers required by the preceding table for vessels carrying passengers, an approved carbon dioxide, foam type or carbon tetrachloride fire extinguisher which has demonstrated a capacity for extinguishing burning oils, burning gasoline, and other burning products of petroleum, in accordance with the following table.

Automobiles or motor vehicles carried	Carbon dioxide or foam type fire extinguishers	Carbon tetrachloride fire extinguishers	Automobiles or motor vehicles carried	Carbon dioxide or foam type fire extinguishers	Carbon tetrachloride fire extinguishers
1 and not over 5	1	4	21 and not over 20	4	8
6 and not over 10	2	5	31 and not over 40	5	10
11 and not over 20	3	6	41 and not over 50	6	12

For each additional 20 automobiles or motor vehicles, or fraction thereof, add one carbon dioxide or one foam or two carbon tetrachloride fire extinguishers.

The requirements may be reduced to 25 percent, but not less than one of either, when an efficient overhead water-sprinkling system, a carbon dioxide, or a foam system with sufficient hose to reach all parts of the deck where automobiles or motor vehicles are carried is installed, said systems to be installed in accordance with drawings or blueprints and specifications approved by the Coast Guard District Commander of the district having original jurisdiction.

When a vessel is provided with enough fire extinguishers to take care of all the automobiles or motor vehicles that can be carried, no extra fire extinguishers shall be required for any number of motorcycles carried.

Extra safety-valve units shall be carried on board for 50 percent of hand fire extinguishers of the foam type, and extra charges shall be carried on board for 50 percent of each class of fire extinguishers provided. If 50 percent of each class of fire extinguishers carried gives a fractional result, extra charges and extra safety-valve units shall be provided for the next largest whole number.

Example

Fire extinguishers carried	Extra charges required
1	1
2	1
3	1
4	2
5	2

Provided, however, That when provided with carbon-dioxide type of fire extinguishers, either an additional carbon dioxide extinguisher or a 2½-gallon foam extinguisher may be furnished. For that 2½-gallon foam extinguisher no extra charge will be required.

There shall also be carried on board a complete recharge for any fixed or built-in fire-extinguishing system that has been approved by the Commandant, except systems for engine rooms, fire rooms, and cargo holds.

Fire extinguishers shall be located in such parts of the vessels as in the judgment of the Officer in Charge, Marine Inspection, will be most convenient and serviceable in case of emergency, and so arranged that they may be easily removed from their fastenings. Every fire extinguisher thus provided for shall be discharged and examined at each annual inspection. *Provided*, That carbon tetrachloride fire extinguishers shall be tested for their pumping efficiency and the liquid discharged with proper care so that it may be replaced in the extinguishers. Carbon dioxide fire extinguishers shall be checked by weighing to determine contents, and, if found to be more than 10 percent under required contents of carbon dioxide, shall be recharged.

Every fire extinguisher provided for and required by this section shall be tested by the Bureau of Standards, Department of Commerce, and a report made by that bureau to the Commandant, who shall then determine whether the said extinguisher shall be approved for use on vessels subject to inspection.

Every fire extinguisher approved after September 5, 1933, for use on vessels under the jurisdiction of the Coast Guard shall have affixed thereto a metallic name plate having plainly stamped thereon the name of the fire extinguisher, the rated capacity in gallons, quarts, or pounds, and the name and address of person or firm for whom approved, and the identifying mark of the actual manufacturer.

Recharges, particularly the acid, used in charging soda-and-acid type of fire extinguishers, must be packed in such manner that the filling operation (i. e., in recharging the extinguisher) can be performed without subjecting the person doing the recharging to undue risk of acid burns and shall be contained in Crown stopper type of bottle.

77 14 Fire equipment on vessels using oil as fuel. On all passenger vessels there shall be fitted an approved carbon dioxide or foam-type system for extinguishing fire in the bilges of each fireroom. If engine and boiler rooms are not entirely separate and fuel oil can drain from the boiler-room bilge into the engine room, the combined engine and boiler rooms shall be considered one compartment. The system shall be capable of being operated from a convenient and accessible point outside of space protected.

When a carbon dioxide (CO₂) system is fitted, the quantity of carbon dioxide carried shall be sufficient to give a gas saturation of 25 percent of the gross volume of the largest boiler room, from tank top to top of the boilers. Top of the boilers is to be considered as the top of the shell of a Scotch or leg type of boiler, and the top of the casing or drum, whichever is the higher, on water-tube boilers. The quantity of carbon dioxide required may be determined approximately by the following formula:

$$W = \frac{L \times B \times D}{36}$$

Where

W = the weight of CO₂ required in pounds

L = the length of the boiler room in feet

B = the breadth of the boiler room in feet.

D = the depth of the boiler room in feet

The whole charge of gas shall be capable of being released instantaneously by operating one valve and control. All cylinders shall be completely discharged in not more than 2 minutes. The arrangement of the piping shall be such as to give a general and fairly uniform distribution over the entire area protected. An alarm shall be provided to give a warning in the space when the carbon dioxide is about to be released. Provision shall be made to prevent the admission of air into the lower parts of the boiler room while the system is in operation.

When a foam-type system is fitted its capacity shall be such as to rapidly discharge over the entire area of the bilge (tank top) of the largest boiler room a volume of foam 6

inches deep The arrangement of piping shall be such as to give a uniform distribution over the entire area protected The foregoing system may be of a type employing either 2-solution tanks or one or more generators using an approved dry chemical mixture

All containers and valves by which they are operated shall be easily accessible and so placed that they will not readily be cut off from use by an outbreak of fire

In addition to the foregoing, there shall be provided one fire extinguisher of the foam type of at least 40 gallons rated capacity or one carbon dioxide (CO₂) of at least 100 pounds in steamships having one boiler room, and one such fire extinguisher in each additional boiler room These extinguishers shall be equipped with suitable hose and nozzles on reels, or other practicable means, easy of access and of sufficient length to reach any part of the boiler room and spaces containing oil-fuel pumping units *Provided*, That on vessels of 750 gross tons and under, foam-type fire extinguishers of at least 20 gallons rated capacity or carbon dioxide (CO₂) of at least 50 pounds, fully equipped as the fire extinguishers above described, may be used

On all vessels of over 500 gross tons, using oil as fuel, there shall be in each fireroom a metal tank containing 10 cubic feet of sand, fitted with a scoop or shaker, for fire purposes, also 2 or more approved fire extinguishers of the carbon dioxide (CO₂) type, of not less than 15 pounds capacity each, or 2 foam-type fire extinguishers of not less than 2½ gallons capacity each

On all vessels of less than 500 gross tons, using oil as fuel, there shall be in each fireroom a metal tank containing not less than 5 cubic feet of sand, fitted with a scoop or shaker, for fire purposes; also one carbon dioxide fire extinguisher of not less than 15 pounds capacity, or one foam-type fire extinguisher of not less than 2½ gallons capacity

77 15 Water-sprinkling system On and after December 31, 1916, all steamers carrying passengers, and which also carry freight upon the main deck which is accessible to passengers or crew while being navigated, shall have installed in such main-deck freight space an efficient overhead water-sprinkling system

The crew and passenger sleeping accommodations located below the main deck on steamers engaged in the passenger traffic shall have installed therein an efficient overhead water-sprinkling system, unless such quarters and the bed frames therein are constructed of metallic or noncombustible material, thereby making them practically fireproof

On steamers carrying passengers where the kitchens or galleys are located below the main deck, there shall be installed in such kitchens or galleys an efficient overhead water-sprinkling system This paragraph shall become effective July 1, 1917

The water-sprinkling system above referred to shall be reliable and efficient and so located that the volume of discharge shall be sufficient to entirely cover or blanket the freight in case of fire, and to entirely and fully sprinkle the compartment in which the passengers or crew may be accommodated below deck, and be installed in such manner as to be easily and quickly accessible of operation, and shall be ready for service at all times when freight or passengers are on board The operating valves for the sprinkling system shall be suitably marked

77 16 Fire-detecting, alarm, automatic sprinkler, and patrol systems, new and existing vessels. (a) (1) All passenger vessels with berth or stateroom accommodations for 50 or more passengers shall be fitted, unless deemed unnecessary by the Commandant for the proper protection of life, with an automatic water-sprinkling system of a type approved by the Commandant, which system shall be so installed as to protect all enclosed parts of the vessel accessible to passengers or crew while the vessel is being navigated, except cargo holds, machinery spaces, and when of fire-resisting construction, toilets, bathrooms, and spaces of similar construction

Where, in the case of a particular vessel, the Commandant does not consider the installation of an automatic water-sprinkling system necessary, such vessel shall be protected in such enclosed parts of the vessel as the Commandant shall deem necessary, with an auto-

matic electric or pneumatic fire-detecting and alarm system, used singly or in combination, of a type approved by the Commandant

(2) All passenger vessels of more than 150 feet in length having berth or stateroom accommodations for less than 50 passengers, shall be fitted with an automatic fire-detecting and alarm system of a type approved by the Commandant. Such system may be electric, pneumatic, automatic sprinkler or a combination of each

(b) (1) All passenger vessels having berth or stateroom accommodations for passengers shall be provided with an efficient supervised fire patrol system of an approved type which will record the time of each visit to each recording station, unless the stations are so interrelated as to require operation of all stations of a route in a fixed order, in which case the record shall show the time of start and finish of each tour

(2) The date of both the night and morning portions of the patrol shall be entered on the record. The records shall be available for review by inspectors for a period of 6 months after the date to which such records refer

(3) The station boxes shall have seals placed over the securing screws in order to leave evidence of removal or tampering. The number and location of recording stations, the order in which they are visited, and the number undertaken by one patrolman shall be approved by the Commandant

(4) Where the system is not equipped with a recording apparatus in the control station¹ the patrolman shall report to the bridge every hour

(c) All passenger vessels of more than 150 feet in length having berth or stateroom accommodations for passengers which are not equipped with a fire-detecting system in cargo spaces, shall be equipped with an approved smoke-detecting system in all cargo spaces which are inaccessible to passengers or crew while the vessel is being navigated. Cargo spaces which are accessible to passengers or crew while the vessel is being navigated shall be equipped with a water-sprinkling system

(d) All passenger vessels with sleeping quarters for passengers shall be provided with an approved manual fire alarm system which operates alarm bells in the pilothouse, engine room, and emergency squad quarters where provided. The manual fire alarm system shall be installed in accordance with the plans approved by the Commandant and shall have a suitable number of stations on all decks so as to enable the patrolman to give the alarm immediately in case of fire

77 17 Fire-detecting and automatic sprinkling systems—(a) Provisions common to all systems—(1) General (i) All devices and equipment installed shall be of a type and character suitable for marine use, and shall be approved by the Commandant

(ii) In addition, parts and samples of any equipment shall be submitted by the manufacturers for test purposes, upon request of the Coast Guard

(iii) Furthermore, all apparatus, devices, and circuits of/as a complete system shall withstand a 60-day endurance test without repair, one-half of which time shall be at sea service

(iv) Fire-alarm systems shall not be used for the transmission of other than fire-alarm signals

(v) Systems shall be normally free of electrical grounds

(vi) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the American Institute of Electrical Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions. All conductors shall be lead sheathed to protect against moisture and conductors exposed to mechanical injury shall be leaded and armored. Lead-sheathed conductors may be used for voltages of 60 volts or less. In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermo-

¹ These stations in which a 24-hour watch is maintained and in which, (1) navigating equipment is located, or (2) radio equipment is located, or (3) central fire station where fire recording instruments are located.

stats in each thermostat zone, but approved multiconductor cable may be used to connect the several individual zones to the annunciator panel

(2) **Maintenance and test** (i) With each equipment there shall be furnished a framed chart which shall be visible in the wheelhouse at all times, bearing full instructions for operation, maintenance, and test of the system

(ii) This chart shall bear tabulated spaces for the date and signature of a licensed officer of the ship who shall witness or conduct tests of the system at intervals not less frequent than required in the specification forming part of the Commandant's approval. It is recommended that periodic inspections be made by the manufacturer of the equipment

(iii) The chart shall list the minimum spare material which is required in each equipment in the specification forming part of the Commandant's approval

(3) **Classification** Protection shall be provided by systems of the following types, used singly or in combination

(i) Electrical system, using thermostats or thermostat wire operating by heat to produce visual and audible signals

(ii) Pneumatic-tube system, using thermostats composed of copper tubing containing air, the expansion of which produces visual and audible signals

(iii) Smoke-pipe system, in which fire is indicated visually and by the sense of smell by smoke drawn through pipes and suitably illuminated

(b) **Electrical and pneumatic-tube systems—(1) Scope of installations** (i) For vessels 150 feet and under in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or in the engine room

(ii) For vessels above 150 feet and under 350 feet in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or chart room, and shall provide an auxiliary audible alarm in the engine room

(iii) For vessels 350 feet or more in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or chart room or in a fire station in which a 24-hour watch is kept, and shall provide an auxiliary audible alarm in the engine room

(iv) Annunciators or other indicators shall be clearly marked to show the fire-alarm circuit protected and shall indicate or function until manually restored

(2) **Location of detectors, electrical system** (i) Detectors (thermostats) shall be installed overhead in the high point of each compartment protected. At least one detector shall be installed in each such compartment. Detectors (thermostats) shall not be approved for use in cargo compartments or other inaccessible places after June 30, 1933, unless satisfactory provision is made to replace them without ingress to the compartment in which they are located

(ii) On smooth ceilings detectors shall be spaced not over 15 feet apart and the area protected by a single detector shall not exceed 200 square feet, and no point on the ceiling shall be more than 10 feet away from the detector. For the detectors of the wire type each circuit shall consist of a continuous length of thermostat wire not exceeding 1,000 feet in length. The thermostat wire shall extend into each compartment protected and no point on the ceiling shall be more than 10 feet away from the thermostat wire

(iii) Thermostat wire shall be run directly on the ceiling or within 12 inches of the ceiling on partitions or bulkheads. In cargo compartments all fire-indicating apparatus shall be installed overhead and not on the ship's side or on bulkheads

(iv) Ceilings divided into panels or bays by beams not more than 8 inches deep shall be regarded as smooth ceilings, otherwise each bay shall be regarded as a separate ceiling

(v) Where these spacing requirements are impracticable because of unusual beam structures, special instructions shall be obtained from Headquarters

(vi) All detectors in cargo spaces, or otherwise subject to mechanical injury, shall be suitably protected by substantial steel protectors crossing over in front of detectors and fastened to beams or brackets or the equivalent

(vii) As required by the Coast Guard, from 3 to 6 spot thermostats for fire-detecting systems installed prior to January 1, 1935, and at subsequent intervals, shall be supplied for test purposes and if found lacking in sensitivity the entire installation of thermostats shall be replaced

(3) Location of detectors, pneumatic-tube system (i) Each circuit shall consist of a continuous length of pneumatic tubing, not exceeding 1,000 feet in length, without branches or alternative paths

(ii) Tubing shall be run directly on ceilings or within 12 inches of ceiling on partitions or bulkheads. In cargo compartments all fire-indicating apparatus shall be installed overhead and not on the ship's side or on bulkheads

(iii) In every inclosed space or separate room there shall be exposed at least 5 percent of total length of tubing or circuit

(iv) In no case shall less than 25 feet of exposed tubing be used in any inclosed space or separate room

(v) On smooth ceilings no point on the ceiling shall be more than 12 feet from nearest point of tubing

(vi) Ceilings divided into panels or bays shall be regarded as smooth ceilings, provided beams are not more than 8 inches deep, otherwise at least one line of tubing shall be run in each bay

(vii) Where these spacing requirements are impracticable because of unusual beam structures, special instructions shall be obtained from Headquarters

(viii) Where necessary, tubing shall be protected against mechanical injury

(ix) Tubing shall be inclosed in conduit or otherwise heat insulated where this is necessary in order to properly isolate signals

(4) Zoning (i) A single fire-alarm circuit shall not include more than 50 individual rooms or storage lockers

(ii) Spaces separated by watertight or main vertical zone bulkheads shall not be included in the same fire alarm zone. Further, a fire alarm zone shall not include spaces on more than one deck except in the case of peak spaces having a combined ceiling area not exceeding 3,000 square feet, or in the case of a system with indicators for individual spaces

(iii) Systems shall be so designed that one circuit becoming inoperative will not affect the operation of any other circuits

(iv) The system shall be so arranged as to permit one or any number of fire-alarm signals simultaneously, and an alarm on any one circuit shall not interfere with the operation of any other circuit

(5) Supervision. (i) The source of energy and all electrical circuits, except as hereinafter provided, shall be under constant electrical supervision. In event of failure of the source of energy or a break in any supervised circuit a distinctive trouble signal or fire-alarm signal shall sound continuously until the trouble is corrected. No switch for silencing this signal shall be provided unless its operation transfers the signal to a trouble lamp

(ii) All trouble circuits, the source of energy for trouble circuits, and normally open secondary circuits on control panels incased in metal protection need not be supervised

(iii) The thermostats themselves need not be supervised if connected in multiple
(iv) A fire gong shall be supervised When multiple fire gongs are used, at least one shall be supervised

(6) **Current supply** (i) The source of energy for the fire-alarm system, including supervisory circuits, shall consist of a storage battery of sealed cells automatically charged from the main bus bars of the lighting system, and used for no other purpose

(ii) The supply voltage shall be not less than 20 volts The system shall be able to operate at 80 percent of normal voltage

(iii) The capacity of the storage battery shall be sufficient to supply the system for at least 48 hours without recharging, and shall be not less than 10 ampere hours

(7) **Fuses** Approved fuses of not less than 3-ampere nor more than 6-ampere capacity shall be provided at or near the bus bars from which the charging current is taken and on charging panel in main discharge leads of battery

(8) **Control panels and devices** (i) All panels and devices shall be capable of operating when inclined to an angle of 45° Operation shall not be affected by vibration

(ii) Audible signals shall be produced on vibrating fire-alarm bells of inclosed type with gongs not less than 6 inches in diameter

(iii) Provision shall be made for silencing the fire-alarm bell by means of a switch operating when the door of the control-panel cabinet is open at least 3 inches, or by equivalent means

(c) **Smoke-pipe systems**—(1) **Scope of installations** Systems of this type shall provide a detecting device to which all smoke pipes shall lead, which device shall be located in the wheelhouse, in a fire control station in which a 24-hour watch is kept, or in convenient proximity to the valves of the extinguishing system, provided there are transmitted to the wheelhouse or fire control station means for determining the compartment reporting the alarm and audible alarms are provided as required in this section

(2) **Construction and installation** (i) The detecting device shall be such that finely divided and diluted particles of smoke shall be readily indicated visually The lighting arrangement shall be such as not to be disturbing to navigation at night For new installations on vessels of over 5,000 gross tons or where installations are not made in the wheelhouse or fire control station, this device shall be provided with an audible alarm in the wheelhouse together with an auxiliary audible alarm located in the engine room

(ii) Smoke collectors shall be installed overhead in each compartment protected and shall be so located that no point on the overhead deck is more than 40 feet from a collector The indicating pipes or tubing shall be not smaller than three-fourths inch inside diameter When more than one smoke collector is required for a compartment, not more than two collectors may be connected to one indicating pipe Each compartment shall have one or more indicating pipes extending to the detecting device, except that the pipes from small adjacent compartments not exceeding a combined volume of 5,000 cubic feet may be joined No smoke collectors shall be located nearer to the edge of the opening of a ventilator than three times the diameter or equivalent diameter of the opening

(iii) Sufficient quantity of the exhaust shall discharge into the wheelhouse or fire station to permit the detection of fire by odor, and a valve plainly marked and readily operable from that compartment shall be provided to direct the exhaust, if obnoxious, to the outside Where the detecting cabinet is not installed in the wheelhouse or fire station the residual exhaust shall be discharged in the vicinity of the detecting cabinet

(iv) Suction fans shall be furnished in duplicate, and shall be provided with switches to permit their operation from the emergency lighting circuit Where the emergency lighting voltage is less than the normal lighting voltage, one fan shall be so arranged that it may be operated from either source

(v) A trouble signal located in the fire control station or the wheelhouse shall be provided which will indicate the inability of the system to report a smoke alarm

(vi) Where exposed to injury in cargo compartments the collectors and smoke pipes shall be reasonably protected against injury

(vii) All smoke pipes shall be installed to grade to low points and at low points provided with drains. These pipes shall be run with as easy bends as practicable

(viii) The smoke inlets in cargo holds should be examined periodically by the ship's personnel to determine whether inlets are obstructed by corrosion, paint, dust, or other extraneous condition. Smoke tests should be made in all holds and the operation of the system noted

(d) Automatic sprinkling system. (1) The sprinkling system shall, where practicable, consist of pipes fitted with sprinkler heads at suitable distances that will operate automatically in the event of a fire, and spray water on the surrounding area

(2) The system shall be supplied primarily by a pressure tank or tanks of suitable capacity and maintained at the required pressure, and secondarily by an automatically controlled pump so arranged that when the pressure in the tank falls to a predetermined point the pump will cut in. Where a motor-driven sprinkler pump is installed, it shall be capable of being operated from the emergency electrical circuit in case of failure of the main power. Any water standing in the system or the tank should be fresh, and in the event the supply to the pump is salt water, appropriate check valves shall be installed to prevent the salt water entering the tank. Provision should be made to cut in any additional pumping equipment under manual control

(3) Sprinkler systems shall be zoned, and means shall be provided for giving an alarm where it can be most quickly observed by officers or crew in case of water flow from sprinklers, low air pressure, closed supply valves, or operation of thermosensitive elements

(4) The automatic sprinklers, alarm valves, and other fire-protection devices to be used in the above system shall be of a type approved by the Commandant, and the entire system shall be installed in accordance with drawings and specifications approved by the Commandant

(5) All tanks installed on or after January 1, 1939, for use in connection with sprinkler systems shall be constructed, tested, and inspected as unfired pressure vessels in accordance with the provisions of parts 50 to 57, inclusive, of this chapter. All such tanks which were installed prior to January 1, 1939, shall be tested and inspected as unfired pressure vessels in accordance with the provisions of parts 50 to 57, inclusive, of this chapter

77 18 Oxygen-breathing apparatus, gas masks, and flame-safety lamps. All passenger vessels which are provided with sleeping quarters for passengers shall be provided with oxygen-breathing apparatus, gas masks, and flame-safety lamps, as follows

(a) Vessels with 50 to 100 staterooms for passengers, 2 oxygen-breathing apparatus or 2 gas masks

(b) Vessels with more than 100 staterooms for passengers, 4 oxygen-breathing apparatus or 4 gas masks and a flame-safety lamp

(c) Oxygen-breathing apparatus or gas masks shall be kept in operative condition and in the following places. Vessels coming under paragraph (a), one shall be in the pilothouse and one in the engine room. Vessels coming under paragraph (b), two shall be kept in the pilothouse, one in the engine room, one in the wireless room, or on vessels not equipped with wireless, two shall be kept in the engine room

(d) The master and chief engineer shall train a sufficient number of officers and crew in their respective departments in the use of the equipment.

(e) Only oxygen-breathing apparatus and flame-safety lamps that have been approved by the Commandant may be used

(f) Oxygen-breathing apparatus shall be of at least $\frac{1}{2}$ -hour period type, and gas masks shall have the approval of the Commandant

(g) One extra cylinder for each oxygen-breathing apparatus and one extra canister for each gas mask shall be carried

(h) The gas mask mentioned above shall be of an approved type which provides full protection against carbon monoxide and other gases

(i) All vessels equipped with refrigeration of any kind shall carry one gas mask of a kind giving protection against the refrigerant used in addition to the breathing apparatus

77 20 Lubricating oils Lubricating oils for use on board the vessel shall be stored in secure tanks, casks, or cans in the engine-room compartments or storeroom, or in metal-lined lamp lockers or oil rooms Effective on and after April 9, 1941

77 21 Fire extinguishers for emergency power plants In compartments where emergency lighting and wireless units are located, two approved fire extinguishers of either carbon tetrachloride, carbon dioxide, or foam type shall be permanently located at the most accessible points In addition, two fire extinguishers of the above types shall be permanently located so as to be readily accessible to the emergency fuel tanks containing gasoline, benzine, or naphtha

77 21a Fire-resisting bulkheads On and after July 1, 1931, all passenger vessels shall be fitted above the bulkhead deck with fire-resisting bulkheads which shall be continuous from side to side of the vessel and arranged to the satisfaction of the Commandant The mean distance between any two adjacent fire-resisting bulkheads in any superstructure shall, in general, not exceed 131 feet For additional requirements see Part 144—Construction or Material Alteration of Passenger Vessels of the United States of 100 Gross Tons and Over Propelled by Machinery, Chapter I, Title 46, Code of Federal Regulations

77 22 Construction of motion picture booths—(a) Booths Apparatus for projecting motion pictures using inflammable (nitrocellulose) film or slow-burning (acetate cellulose) film shall be contained in a fire-resistive booth or inclosure It shall be not less than 7 feet in height and of horizontal area not less than 30 square feet for each projector It shall not be located nearer than 10 feet to the principal exits of the room

(1) **Construction of booth.** The framework shall be constructed of structural steel angles or T-irons not less than $1\frac{1}{2}$ inches by $1\frac{1}{2}$ inches by $\frac{1}{4}$ inch, spaced not more than 2 feet apart, or 2 inches by 2 inches by $\frac{1}{4}$ inch, when spaced from 2 feet to 4 feet apart, and shall be suitably braced to withstand lateral strains It shall be securely anchored to the deck The top and sides of the booth shall be covered on the inside of the steel frame with a metal sheet not thinner than No 20 gage, inside of which is placed asbestos millboard not less than $\frac{1}{4}$ inch thick, all properly secured to the framework Transite asbestos boards or asbestos wood may be used without the sheet-metal covering, provided the distance between supports for the $\frac{1}{4}$ -inch thickness does not exceed 2 feet, for the $\frac{3}{8}$ -inch thickness, 3 feet, for the $\frac{1}{2}$ -inch thickness, 4 feet The door shall be constructed similar to the booth, and shall be not less than 2 feet wide and 5 feet high, shall be self-closing, fit its frame tightly, and be provided with proper latches The floor shall be covered with one thickness of $\frac{3}{8}$ -inch asbestos millboard or transite board

All joints shall be made smoke proof

(2) **Openings in booth.** The booth shall be provided with a ventilating inlet on each of the three sides, each to be about 15 inches long and 3 inches high, covered on the outside with wire netting of mesh not greater than $\frac{1}{8}$ inch, securely fastened to the wall In the top of the booth shall be located an air-outlet opening of not less than 100 square inches for each projector connected by a fire-resistive flue to a safe distance above the top deck if the booth is located below deck The flue shall be securely supported on the framework of the

booth This is designed to provide for an air current through the booth, when operating, of 30 or more cubic feet per minute. If in the given location this is not accomplished, artificial ventilation, as by means of a fan within the booth, shall be introduced.

Two openings shall be provided at the front of the booth, one for the machine and the other for observation by the operator, the maximum area of each opening not to exceed 70 square inches. These openings as well as the air inlets near the bottom of the booth shall be provided with gravity doors made of iron or steel not less than $\frac{3}{8}$ inch in thickness, of size to overlap the openings by at least 2 inches, and arranged to slide without binding in properly constructed grooves, the joint between door and wall to be smoke-tight when doors are closed, said doors to be held open normally by the use of a fine combustible cord fastened to a fusible link located above the projector which melts at a temperature of 71° C (160° F), the whole being so arranged that the doors will close automatically upon severing of the cord or the fusing of the link. Provision shall also be made for closing said doors by hand from the outside of the booth.

(3) **General requirements.** All films on board shall at all times be kept within the operating booths, except as otherwise herein provided. They shall be contained in individual metal boxes, except for the film in the machine and the film immediately before it is placed in or immediately after removal from the machine. Where not over five 5-pound reels are present in the booth they may be placed on incombustible shelves, suitably secured against displacement by the motions of the boat. Where more than 5 reels but not more than 10 reels are present, they shall be kept in closed shelves or cabinets similar in construction to that of the walls of the booth. Where more than ten 5-pound reels are present, they are to be stored in an insulated film cabinet, the cabinet to be constructed per appended specifications.

All rewinding and repair of film shall be conducted within the projecting booth, unless a place with equal safeguards is provided.

When in use the door of the booth shall be closed and when not in use it shall be locked.

The projecting machine is to be suitably secured against displacement by the motions of the boat. All electric wiring and connections shall conform with accepted standards for the given purpose (National Electric Safety Code or National Electric Code). No smoking, matches, or lights other than properly guarded electric lights shall be permitted within the booth.

(b) **Cabinets.** (1) The size of a cabinet for the temporary storage of films on board shall not exceed 10 cubic feet, and shall not be used for storage at one time of more than forty 5-pound reels. The reels shall be contained within suitable metal containers and be held on racks in such manner as not to be displaced by the motions of the boat.

(2) The cabinet shall be constructed of incombustible materials throughout and shall be tightly enclosed. It may be made of sheet iron of not less than No. 18 U. S. gage, stiffened with angle irons, double walled, with not less than 2 inches of space between walls, filled with incombustible insulating material, or equivalent construction. The door shall be constructed equivalent to the walls of the cabinet, shall be self-closing, fit closely, and be kept closed and locked at all times except when films are being removed from or placed in the cabinet. If the cabinet is located within the booth, the door of the cabinet shall open outward through the wall of the booth, with tight joints between the booth wall and the cabinet or door. The cabinet shall otherwise be kept in a hold for the storage of hazardous materials. The cabinet shall be secured to the deck by fastenings attached to the outer angle irons.

(c) **Fire extinguisher required.** At least one fire extinguisher of a kind approved by the Commandant shall be placed near every such booth and be accessible at all times.

(d) **Motion-picture projectors** (1) Motion-picture projectors of the 16 mm or 8 mm size, using only slow-burning films, need not be of an approved type and may be used on inspected vessels without booths

(2) Motion-picture projectors using the 35 mm size films shall only be used in booths, constructed in accordance with the specifications in paragraph (a) of this section and must be of an approved type

77.23 Regulations to guard against and extinguish fire reestablished The regulations in this part to guard against and extinguish fire, in effect on April 8, 1941, established under the authority of Title LII of the Revised Statutes of the United States (R S Sections 4399-4500, inclusive), are hereby reestablished under the authority of section 2 (a) of the Act of October 9, 1940 (46 U S C 463a), and effective on and after April 9, 1941

77 24 Liquefied petroleum gases for cooking and heating—(a) Liquefied petroleum gas (definition) For purposes of this section "liquefied petroleum gas" shall be defined as any liquefied inflammable gas which is composed predominantly of hydrocarbons or mixtures of hydrocarbons, such as propane, propylene, butanes, butylenes, and butadienes, and which has a Reid ¹ vapor pressure exceeding 40 pounds per square inch absolute or a vapor pressure exceeding 25 pounds per square inch gage at 100° F, as determined by the Natural Gasoline Association of America's ² method or other recognized test method

(b) **Approvals** Liquefied petroleum gas may be used on inspected vessels, except passenger vessels *Provided,*

(1) Gas consuming appliances are approved for use of liquefied petroleum gas by the American Gas Association Testing Laboratories (as indicated by label or seal of approval for liquefied petroleum gas on stationary installations) and are also approved by the Commandant

(2) Cylinders or drums in which liquefied petroleum gas is stored and handled shall comply with Interstate Commerce Commission specifications and retest requirements for the specific gas filled therein

(3) The relief valves, shut off valves, excess flow valves, pressure regulators, and vaporizer, when used, shall conform to the requirements of and bear the label of the Underwriters Laboratories, Inc, or other recognized testing laboratory

(4) The location and installation of gas burning appliances, gas cylinders and regulating equipment, together with all piping must be approved by the Commandant

(c) **Odorization of gas** All liquefied petroleum gas used on vessels shall be effectively odorized by an agent of such character as to indicate positively by a distinctive odor the presence of gas down to a concentration in air of not over $\frac{1}{4}$ the lower limit of combustibility

(d) **Location and security of containers** (1) Cylinders shall be located in a substantially constructed and firmly fixed metal inclosure located on or above the weather deck level Access to this inclosure shall be from the weather deck only This inclosure shall be so constructed that when the access opening is closed any gas leakage can escape only through a top and bottom ventilating system which shall consist of a fresh air inlet pipe and an exhaust pipe both entering the inclosure from above

(2) Cylinders or drums located within the metal inclosure shall be suitably secured in place

(3) Storage of spare and empty cylinders must be within the metal inclosure or they must be properly chocked on the weather deck

(e) **Valves and regulators** (1) A spring loaded relief valve shall be incorporated in the system, its size and pressure setting to be according to Interstate Commerce Commis-

¹ American Society for Testing Materials Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method) (D-323), most recent revision

² Natural Gasoline Association of America Tentative Standard Method for Determination of Vapor Pressure of Liquefied Petroleum Gas Products most recent revision

sion's requirements, and it shall be located and vented within the metal inclosure. This relief valve must be located on or between the cylinder and the pressure regulator.

(2) The low pressure side of all pressure regulators shall be protected against excessive pressure by means of a suitable relief valve which shall discharge into the metal inclosure.

(3) All regulator vents must discharge into the metal inclosure.

(4) All valves and regulators embodied in the system for the purpose of pressure relief, regulation, and control of gas pressure and flow rates, shall be securely mounted in positions readily accessible for inspection, maintenance, and testing.

(5) Valves in the assembly of multiple cylinder systems shall be so arranged that the change of cylinders may be made without shutting down the system.

(6) A shut off valve shall be installed in each branch connection.

(f) **Vaporizers.** Where a vaporizer is required approval shall be obtained from the Commandant.

(g) **Piping and fittings.** (1) All piping shall be installed so as to provide minimum interior runs with adequate flexibility.

(2) The piping between the cylinders and the appliances shall be seamless annealed copper tubing or any other tubing approved by the Commandant. The tubing connections shall be flared and the number held to a minimum.

(3) All piping or tubing shall be tested (such as with a manometer employing water) after assembly and at each annual inspection and proved free from leaks at not less than normal operating pressures. Tests may be made by qualified persons acceptable to the Officer in Charge, Marine Inspection, and one copy of a report of such test shall be posted and another copy forwarded to the Officer in Charge, Marine Inspection, in the district in which the test was made.

(h) **Ventilation of compartments having gas appliances.** (1) Compartments which are located above the weather deck and which contain gas consuming devices shall be ventilated by openings to the outside near the deck level and by openings overhead or near the overhead in the compartment. Mechanical ventilators may also be provided.

(2) Where compartments in which gas consuming devices are located are entirely below the weather deck, mechanical ventilation shall be provided with sufficient capacity to effect a change of air at least once every six minutes.

(i) **Identification and instructions.** (1) The outside of metal inclosure housing liquefied petroleum gas cylinders, valves and regulators shall be marked

Liquefied Petroleum Gas
Keep Open Fires Away
Operating Instructions
Inside and In-----

(2) Operating Instructions shall be framed under glass and shall be posted prominently, both in the interior of the metal inclosure and near the most frequently used gas consuming device so they may be easily read.

(j) **Operating instructions.** (1) Before opening a cylinder valve, the outlet of cylinder shall be connected tightly to system, and, in the case where only a single cylinder is used in the system, all appliance valves and pilots must be shut off before the cylinder valve is opened.

(2) Before opening cylinder valve after connecting it to system, the cylinder shall be securely fastened in place.

(3) When cylinders are not in use their outlet valves shall be kept closed.

(4) Cylinders when exhausted shall have their outlet valves closed.

(5) Nothing shall be stored in the metal inclosure except liquefied petroleum gas cylinders and permanently fastened parts of the system.

(6) Valve protecting caps if provided shall be firmly in place on all cylinders not attached to the system. Caps for cylinders in use may remain in metal inclosure if rigidly fastened to the metal inclosure structure.

(7) The opening into the metal inclosure must be closed at all times except when access is required to change cylinders or maintain equipment.

(8) Gas pressure to consuming devices should be approximately eleven inches water column (6.4 oz. per square inch).

(9) No smoking should be permitted in the vicinity of the metal inclosure when access to inclosure is open.

(10) If electric connections are made within the metal inclosure they must be installed in strict accordance with the requirements of the National Electrical Code¹ for Class I, Group D, Hazardous Locations.

(11) Tests for gas leaks should be made with a soap solution or low freezing point liquids but in no case shall a flame be used.

(12) Report any presence of gas odor to _____

¹ A copy of this Code, National Board of Fire Underwriters' pamphlet No. 70, has been filed with this document in the Division of the Federal Register. Copies are also on file with the various Coast Guard District Commanders for reference purposes.

PART 78—SPECIAL OPERATING REQUIREMENTS

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CROSS REFERENCE

Definition of terms See § 76 01

NOTE—The rules and regulations regarding the examinations for and the issuing of licenses, certificates, raising of grade, etc., and other matters relative to merchant marine personnel are contained in a separate publication entitled, "Rules and Regulations for Licensing and Certifying of Marine Personnel"

Section 78 12a Notice to mariners, aids to navigation (a) Licensed officers are required to acquaint themselves with the latest information published by the Coast Guard and the United States Navy regarding aids to navigation, and neglect to do so is evidence of neglect of duty. It is desirable that vessels navigating oceans and coastwise and Great Lakes waters shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners. All vessels shall have charts of the waters on which they operate available for convenient reference at all times.

(b) Notice to Mariners published weekly by the Coast Guard which contains announcements and information regarding aids to navigation and charts of waters of the United States is available for free distribution at the following places: Field offices of the Coast Guard, United States Coast and Geodetic Survey field stations, and the Marine Division, Customhouse. Notice to Mariners published weekly by the United States Navy for the correction of charts, sailing directions, light lists and other publications, and which includes foreign waters and certain waters of the United States, is available for free distribution at the Hydrographic Office, Branch Hydrographic Offices, or any of the agencies of seaboard ports, and is also on file in the United States consulates where they may be inspected.

78.16 Notice of casualty and voyage records (a) The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the U S Coast Guard whenever the casualty results in any of the following:

- (1) Damage to property in excess of \$1,500 00
- (2) Material damage affecting the seaworthiness or efficiency of a vessel
- (3) Stranding or grounding
- (4) Loss of life
- (5) Injury causing any persons to remain incapacitated for a period in excess of 72 hours

(b) The notice required in the above paragraph shall show the name and official number of the vessel involved, the owner or agent thereof, the nature and probable cause of the

casualty, the locality in which it occurred, the nature and extent of injury to persons and the damage to property

(c) In addition to the notice required above, the person in charge of the vessel shall, as soon as possible, report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival *Provided*, That when from distance it may be inconvenient to report in person it may be done in writing only The written report required herein for personal accident not involving death shall be made on Form CG-924E and for all other marine casualties or accidents, the written report shall be made on Form CG-2692

NOTE If filed without delay these forms may also provide the notice required by paragraph (a) of this section

(d) The owner, agent, master, or other person in charge of any vessel involved in a marine casualty shall retain such voyage records of the vessel as are maintained by the vessel, such as both rough and smooth deck and engine room logs, bell books, navigation charts, navigation work books, compass deviation cards, gyrocompass records, stowage plans, record of draft, aids to mariners, radiograms sent and received, the radio log and crew and passenger lists The owner, agent, master, or other officer in charge, shall make these records available to a duly authorized Coast Guard officer or employee for examination upon request

(e) Whenever a vessel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection No report on Form CG-2692 is required unless any of the results listed in paragraphs (a) (1) to (a) (5), inclusive, of this section occurs

78 17 Persons allowed in pilothouse and on navigation bridge Masters and pilots of vessels carrying passengers shall exclude from the pilothouse and navigator's bridge of such vessels, while under way, all persons not connected with the navigation of such vessels *Provided*, That inspectors of the Coast Guard, licensed officers of vessels, persons regularly engaged in learning the profession of pilot, officers of the Coast Guard, United States Navy, United States Coast and Geodetic Survey, and Engineer Department of the United States Army, may be allowed in the pilothouse or upon the navigator's bridge upon the responsibility of the officer in charge

The master of every such passenger and ferry vessel shall keep three printed copies of this section posted in conspicuous places on such vessel, one of which shall be kept posted in the pilothouse

Such printed copies shall be furnished by Headquarters to Officers in Charge, Marine Inspection, for distribution

78 18 Station bills, drills, and reports of masters—(a) Station bills and muster lists It shall be the duty of the master of every vessel carrying passengers and all other vessels of over 500 gross tons and subject to inspection, to cause station bills and muster lists to be prepared which shall be signed by the master who shall be responsible for their preparation. The station bills and muster lists shall be posted in conspicuous places in several parts of the vessel, particularly in the crew's quarters, and must contain full particulars of the signals which will be used for calling the crew to their stations for emergency duties Special duties shall be allotted to each member of the crew and the muster lists shall show all these special duties and indicate the station to which each man must go and the duties he has to perform The special duties should, as far as possible, be comparable to the regular work of the individual On passenger vessels where the size of the crew will permit, several members of the crew should be designated as an emergency squad and required to report to the bridge with certain equipment for instructions. The duties provided for by the muster lists should include.

(1) The closing of airports, watertight doors, fire doors and fire screens, the covers and all valves of all scuppers, sanitary and other discharges which lead through the ship's hull below the margin line, and stopping the fans and ventilating systems

(2) The extinction of fire

(3) The equipment of boats, rafts, and buoyant apparatus and their preparation for launching

(4) The muster of passengers

(i) Warning the passengers

(ii) Seeing that they are dressed and have put on their life jackets in a proper manner.

(iii) Assembling the passengers and directing them to the appointed stations

(iv) Keeping order in the passages and on the stairways and generally controlling the movements of the passengers

(b) **Emergency signals** The general fire alarm signal shall be a continuous rapid ringing of the ship's bell for a period not less than 10 seconds supplemented by the continuous ringing of the general alarm bells for not less than 10 seconds. For dismissal from fire alarm stations, the general alarm bells shall be sounded three times, supplemented by three short blasts of the whistle. The signal for boat drill or boat stations shall be more than six short blasts and one long blast of the whistle supplemented by the same signal on the general alarm bells

Where whistle signals are used for handling boats, they shall be as follows

To lower boats one short blast of the whistle

To stop lowering the boats two short blasts of the whistle

For dismissal from boat station three short blasts of the whistle. *Provided, That on river vessels the whistle signals herein may be made on the ship's bell*

The master of any vessel may establish such other emergency signal, in addition to the above, as will provide that all the officers and all the crew and passengers of the vessel will have positive and certain notice of the existing emergency

(c) **Emergency squad** The master may organize a squad to be used for emergency duties (other than a general emergency), or crew practices, and the nature of the signals or other means for assembling the squad remains within the discretion of the master. Such signals should not conflict with the navigational signals or the signals used for a general alarm.

(d) **Drills, tests and inspection.** It shall be the duty of the master, or the mate, or officer next in command, once at least in each week, to call all hands to quarters and exercise them in discipline, and (weather permitting) in the unlashing and swinging out of the lifeboats, the closing of all hand- or power-operated watertight doors which are in use at sea, closing all fire doors and fire screens, the use of fire pumps, and all other apparatus for the safety of life on board of such vessels, with special regard for the drill of the crew in the method of adjusting life preservers and educating passengers and others in this procedure, and to see that all the equipments required by law are in complete working order for immediate use, the fact of exercise of the crew, as herein contemplated, shall be entered upon the vessel's log book

The rule relating to fire and boat drills contemplates that such drills shall be conducted precisely as though an emergency existed. To accomplish the purpose of the rule, lifeboat covers and strongbacks shall be removed, plugs or caps put in place, boat ladders secured in position for use, painters carried forward and tended so as to provide a good lead and slack to hold the boat in position under the davits when in the water. The person in charge of each lifeboat or life raft should have a list of its crew and should see that the men under his orders are acquainted with their several duties. The hand pumps and fire pump shall be operated long enough and a sufficient number of outlets used to insure that such equipment is in order and effectual. The motor and the hand-operated propeller gear of each

lifeboat shall be operated for a period of not less than 5 minutes once at least in every 7 days, in order that it may be ready for service at any time. Such operation shall be a part of the lifeboat drill, and the fact of such operation shall be made a part of the report of such drill. When oxygen-breathing apparatus, gas masks, or other special equipment is carried certain members of the crew shall be trained in the use of the equipment.

(e) **Log book entries** The entries in the vessel's log book relating to the exercise of the crew in fire and boat drills shall state the day of the month and the hour when so exercised, length of time of the drill, number on the boats swung out, number of lengths of hose used, and a statement of the condition of all fire and lifesaving apparatus.

(f) **Penalty** For any neglect or omission on the part of the officer in command of such vessels to strictly enforce the provisions of this section, he may be proceeded against in accordance with the provisions of section 4450, R. S., as amended, looking to a suspension or revocation of his license.

(g) **Additional requirements** It shall be the duty of the inspectors to require the officers and crew of all such vessels to perform the aforesaid drills and discipline in the presence of said inspectors at intervals sufficiently frequent to assure the said inspectors, by actual observance, that the foregoing requirements of this section are complied with.

The master of every passenger vessel shall report monthly the day and date of such exercise and drill, the number of lifeboats on board and the number on the boats that were swung out at each drill, the condition of the vessel and her equipments, and also the number of passengers carried. These reports shall be made to the office of the Coast Guard District Commander of the district where the vessel was last inspected. That officer will forward the reports to the Officer in Charge, Marine Inspection, in which district the vessel operated during the greater part of the month to which the report relates, through the office of the proper Coast Guard District Commander.

Three copies of this section shall be furnished every vessel carrying passengers and one to all other vessels to which this section applies, to be framed under glass and posted in conspicuous places about the vessel.

78.19 Cable and lanyard On all vessels where the distance is more than 150 feet between deck houses, a wire cable shall be stretched between the deck houses at all times when the vessel is loaded and being navigated, this cable to be not less than 5 feet from the deck, and there shall be attached at all times to the cable a traveler with a line of sufficient continuous length to insure its operation, in order that communication between both ends of the vessel may be facilitated at all times. *Provided*, That a number of metal rings with suitable lanyards attached, equaling in number the total number of persons carried, may be attached to the cable in lieu of the traveler and endless whip, and that suitable manila lines of sufficient length shall be kept dry and coiled at each end of the vessel ready for immediate use in order that communication between both ends of the vessel may be facilitated at all times. Failure to have such cable stretched and traveler, or rings with lanyards, attached at all times when the vessel is loaded and being navigated, may be sufficient cause for instituting procedure under R. S. 4450 (sec. 4, 49 Stat. 1381, 50 Stat. 544, 46 U. S. C., Sup., 239) looking to a suspension or revocation of the license of the master or officer in charge. *Provided*, That a fore and aft raised bridge or other equivalent means of access as determined by the Coast Guard District Commander, such as a passage below deck, may be accepted in lieu of the wire cable and its equipment.

78.20 Steering gear tests On all vessels under the jurisdiction of the Coast Guard, the entire steering gear, the whistle, the means of communication, and the signaling appliances between the bridge or pilothouse and engine rooms shall be examined and tested by a licensed officer of the vessel at least once in every week and an official record kept of the fact and time of such examination and test.

78.20a Steering orders "Right rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the right

"Left rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the left

Where rudder indicators are provided, they shall be installed consistent with the foregoing

78.21 Cargo hatches It shall be the duty of the master of any vessel under the jurisdiction of the Coast Guard, and which is carrying cargo, to assure himself before leaving port that all the cargo hatches of his vessel are properly covered and the covers secured. The covers of all exposed cargo hatches shall be made watertight by fitting to them gaskets, or by being thoroughly covered with hatch cloths or tarpaulins firmly secured by iron or steel bars extending from side to side or end to end of hatchway, which bars shall be fastened by toggles or wedges of hardwood or by efficient screw fastenings. Wooden hatch bars of sufficient size or strength maintained in good condition may be accepted in lieu of the iron or steel bars above referred to. *Provided*, That vessels having 6 feet or more of freeboard, measured vertically from the water's edge at the lowest point of sheer to the top of deck at the ship's side, shall not be required to use the hatch cloths or tarpaulins between March 31 and August 31. The exemption, however, does not relieve the master of any responsibility for the security and protection of his hatches during the interval of exemption, and in case of indications of bad weather or other threatening conditions, he shall not leave port until the cargo and other exposed hatches are properly covered, secured, and protected. Failure of the master of any vessel to observe this section shall be sufficient cause for suspension of his license on a charge of inattention to his duty. *Provided, further*, That vessels constructed with sand boxes or hoppers, the capacity of which does not exceed the safe carrying capacity of the vessel when engaged in the sand, gravel, stone, or coal trade, need not be provided with covers, hatch cloths, or tarpaulins and fastenings for the sand boxes or hoppers.

78.22 Cabin watchmen and fire patrolmen Vessels carrying passengers shall during the nighttime keep a suitable number of watchmen in all passenger quarters and on each deck.

All watchmen shall be under the direct charge of the master or officer in command of the vessel, and each shall report to the officer in command at the pilothouse at fixed intervals of not longer than every hour.

Cabin watchmen and cabin patrols on duty in the nighttime on all vessels shall have in their possession while on such patrol duty a suitable and efficient dry-battery flashlight.

The uniform of the night watchman shall be so conspicuous as to be readily distinguished from other persons, and the coat or sweater marked with a rating badge worn on the left sleeve marked "Watchman," and front of cap marked "Watchman."

Watchmen or patrolmen shall not be required to perform any other duty while on watch.

On all passenger vessels having berth or stateroom accommodations for passengers there shall be maintained while passengers are on board an efficient fire patrol so as to completely cover all parts of the vessel accessible to passengers or crew, at 20-minute intervals between the hours of 10 p. m. and 6 a. m., except machinery spaces, occupied passenger or crew sleeping accommodations, and cargo compartments which are inaccessible to passengers or crew while the vessel is being navigated.

Failure of a patrolman to follow a prescribed route or to record each station within a definite time shall be entered on the record, along with the reason for the irregularity.

The patrolman shall report to the bridge every hour on vessels where the fire patrol system is not equipped with a recording apparatus in the control stations. In vessels requiring more than one patrol route, one patrolman may contact the others and make the joint report to the bridge.

A patrolman while on duty shall have no other tasks assigned to him. He shall be provided with a flashlight and shall wear a distinctive uniform or badge.

In the case of vessels of noninflammable construction which are fitted with an approved automatic fire-detecting and alarm system in public spaces, the patrol throughout the entire patrolled area may be at 1-hour intervals

78.23 Pilothouse watch All passenger and ferry steamers shall, in addition to the regular pilot on watch, have one of the crew also on watch in or near the pilothouse, and this rule applies to all steamers navigating in the nighttime

Nothing in this section shall exonerate any master or officer in command from the consequences of any neglect to keep a proper lookout or the neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case

78.24 Engine signals. Starting, stopping, and backing signals for steam vessels navigating the waters of the Great Lakes and their connecting and tributary waters as far east as Montreal

There shall be used between the master or pilot and engineer the following code of signals, to be made by bell or whistle, namely

1 whistle or 1 bell.....	Go ahead
1 whistle or 1 bell.....	Stop
2 whistles or 2 bells.....	Back
3 whistles or 3 bells.....	Check
4 whistles or 4 bells.....	Strong
4 whistles or 4 bells.....	All right

Two whistles or two bells shall always mean back, irrespective of other signals previously given

78 25 Flashing the rays of a searchlight or other blinding light Flashing the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way is prohibited Any person who shall flash or cause to be flashed the rays of a blinding light in violation of the above may be proceeded against in accordance with the provisions of R S 4450, as amended, looking to the revocation or suspension of his license or certificate

78 26 Unnecessary whistling. Unnecessary sounding of vessel's whistle is prohibited within any harbor limits of the United States Whenever any licensed officer in charge of any vessel shall authorize or permit such unnecessary whistling, such officer may be proceeded against in accordance with the provisions of R S 4450 (46 U S C 239), as amended, looking to a revocation or suspension of his license

78 27 Unauthorized lights Any master or pilot of any vessel who shall authorize or permit the carrying of any light, electric or otherwise, not required by law that in any way will interfere with distinguishing the signal lights may be proceeded against in accordance with the provisions of R S 4450, as amended, looking to a revocation or suspension of his license

78 28 Sanitation. It shall be the duty of the master and chief engineer of any vessel under the jurisdiction of the Coast Guard to see that such vessel and the passenger's and crew's quarters are kept in a sanitary condition Failure on the part of the master (or chief engineer so far as it applies to the engineers' department) of any vessel to observe and carry into effect this section shall be sufficient cause for the suspension of his license on a charge of inattention to his duties

78.29 Steam vessels requiring licensed masters. There shall be a duly licensed master on board every steam vessel of more than 150 gross tons, subject to the inspection laws of the United States, whenever such vessel is under way

78.34 Duties of mates of inland steamers It shall be the duty of the mate of every inland steamer carrying passengers to assign to deck or steerage passengers the space they may occupy on board during the voyage, and to supervise the stowage of freight or cargo, and see that the space set apart for passengers is not encroached upon He shall also carefully examine all marks on packages of freight delivered on board for shipment, with a view

to detect and prevent any combustible or other dangerous articles prohibited by law being delivered on board. One copy of this section shall be furnished every steamer to which this section applies, to be framed under glass and posted on the main deck.

78 38 Tonnage of steam vessels on which pilots may act. (a) The navigation of every steam vessel of more than 150 gross tons shall be under the control of a first-class pilot.

(b) A first-class pilot, or a second-class pilot who has reached the age of 21 years, may act as master or pilot in charge of navigation of a steam vessel not exceeding 150 gross tons.

(c) A second-class pilot is authorized to act as pilot in charge of a watch on any steam vessel within the qualifications specified in his license.

78 39 Pilots governed by rules. Pilots of steam vessels, while in the discharge of their duties, shall be governed by the rules of the Commandant, made for their guidance, and not by any instructions emanating from any inspector or other person.

78 52 Examination of boilers and machinery by engineer. It shall be the duty of an engineer when he assumes charge of the boilers and machinery of a vessel to examine the same forthwith and thoroughly, and if he finds any part thereof in bad condition, he shall immediately report the facts to the master, owner, or agent, and to the Officer in Charge, Marine Inspection, of the district, who shall thereupon investigate the matter, and if the former engineer has been wilfully negligent in the performance of his duties, he may be proceeded against under the provisions of R. S. 4450, as amended, looking to a suspension or revocation of his license.

78.53 Reports of accidents, repairs, and unsafe boilers and machinery by engineers. Before making repairs to a boiler of a steam vessel the engineer in charge of such steam vessel shall report, in writing, the nature of such repairs to the Officer in Charge, Marine Inspection, of the district wherein such repairs are to be made.

And it shall be the duty of all engineers when an accident occurs to the boilers or machinery in their charge tending to render the further use of such boilers or machinery unsafe until repairs are made, or when, by reason of ordinary wear, such boilers or machinery have become unsafe, to report the same to the Officer in Charge, Marine Inspection, immediately upon the arrival of the vessel at the first port reached subsequent to the accident, or after the discovery of such unsafe condition by said engineer. *Provided*, That during the period when a state of war exists between the United States and any foreign nation, communications in regard to accidents shall be handled with caution, and the above-mentioned reports shall not be made by radio or telegram.

PART 79—INSPECTION OF VESSELS

Sec.		Sec.	
79 1	Application for inspection of vessels, exemption of vessels while laid up or dismantled	79 14	Whistles
79 2	Vessels owned or employed by the United States	79 15	Alarm bells
79 3	Authority of inspectors	79 16	Fog bells
79 4	Inspection of hulls	79 17	Posting of instructions for using gun apparatus
79 5	Notice to inspectors of vessel on dock, alterations	79 18	Use of approved equipment
79 5a	Gas-free certificates for repairs or alterations involving hot work	79 18a	Repairs to fire-fighting and lifesaving apparatus
79 6	Certificates of inspection	79 19	Standard in inspection of hulls, boilers and machinery
79 6a	Exhibition of certificate of inspection	79 21	Copies of specifications and/or blueprints
79 7	Permits to go to other ports for repairs	79 21a	Passenger accommodations for ferryboats
79 8	Furnishing of drawings of new vessels to inspectors, marking of draft on vessel.	79 21b	Crew accommodations
79 9	Electrical installations	79 21c	Passenger accommodations for excursion boats and passenger barges
79 11	Emergency lighting system		
79 12	Specifications covering types of voice tubes and telephones		

CROSS REFERENCE

Definition of terms See § 76 01.

Section 79 1 Application for inspection of vessels; exemption of vessels while laid up or dismantled The annual inspection of any vessel subject to the provisions of Title 52, Revised Statutes of the United States, shall be made only on written application, presented to the Officer in Charge, Marine Inspection, by the owner, master, or authorized agent of the vessel to be inspected. Such application shall state upon its face that previous application for inspection has not been made to any other inspector.

Vessels while laid up and dismantled and out of commission are exempted from any or all inspections required under Sections 4417, 4418, 4426, and 4427 of the Revised Statutes of the United States (46 U. S. C. 391, 392, 404, 405).

All vessels or other floating equipment used by or in connection with any "civilian nautical school" as defined by section one of the Act of Congress approved June 12, 1940 (54 Stat. 346, 46 U. S. C. 1331) shall, whether being navigated or not, be subject to all the laws covering the inspection of passenger vessels in effect on or before June 12, 1940, and the regulations thereunder, including the inspection of hulls, the installation and inspection of machinery and boilers, lifesaving and fire-fighting equipment, construction, and the licensing of officers and manning, as more particularly set forth in full in this subchapter and Subchapters E (Load Lines) and F (Marine Engineering) of this chapter.

79 2 Vessels owned or employed by the United States Steam vessels employed by the Government, unless the titles of the same are actually vested in the United States, are not exempt from inspection.

79 3 Authority of inspectors. Inspectors may lawfully inspect any vessel within their respective districts upon proper application.

79.4 Inspection of hulls. In the inspection of hulls of vessels, the inspector shall carefully inspect every accessible part of the hull, and carefully examine the wood or metal of which the hull is constructed, to determine the condition of same, making all necessary hammer tests of hulls constructed of iron or steel. If the inspector shall not have satisfactory evidence otherwise of the soundness of the hull of a wooden vessel, he shall not give a certificate until the same shall be bored or opened up to his satisfaction.

All scuppers, sanitary and other similar discharges which lead through the ship's hull, shall be fitted with efficient means for preventing the ingress of water in the event of a fracture of such pipes

The requirements of the above paragraph do not apply to the discharges in the machinery space connected with the main and auxiliary engines, pumps, etc

All scupper, soil, and sanitary pipes shall be adequately protected, casings to be substantial and so fitted to be conveniently removed for the purpose of examination

79.5 Notice to inspectors of vessel on dock, alterations Whenever any vessel is placed upon the dock for repairs it shall be the duty of the master, owner, or agent to report the same to the Officer in Charge, Marine Inspection, of that district, so that a thorough inspection may by him be made to determine what is necessary to make such vessel seaworthy if the condition or age of the vessel, in the judgment of the inspector, renders such examination necessary

No repairs or alterations affecting the safety of the vessel, either in regard to hull or machinery, shall be made without the knowledge of the Officer in Charge, Marine Inspection Drawings or prints of such alterations shall be furnished, in duplicate, to the Officer in Charge, Marine Inspection, having jurisdiction, one copy of which shall be forwarded to the Commandant Notice of such repairs and changes is necessary, even if such work does not require the vessel to be placed in a drydock, and even if there are no licensed officers attached to the vessel

79.5a Gas-free certificates for repairs or alterations involving hot work On any vessel which has carried inflammable or combustible liquids in bulk, as fuel or cargo, whether in a repair yard or elsewhere, no repairs or alterations involving riveting, welding, burning, or like fire-producing operations shall be made in or on the boundaries of oil bunkers, oil tanks, oil pipe lines and heating coils until an inspection has been made to determine that such operations can be undertaken with safety Such inspections shall be made and evidenced as follows

(a) When in a port of the United States, this inspection shall be made by a gas chemist certificated by the American Bureau of Shipping, however, if the services of such certified gas chemist are not reasonably available, the marine inspector of the Coast Guard, upon recommendation of the vessel's owner and his contractor, or their representatives, shall select a person who, in the case of an individual vessel, shall be authorized to make the inspection If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth that fact in writing and qualified, as may be required, shall be issued by the certified gas chemist or the authorized person before the work is started

(b) When not in such a port and a gas chemist is not available, this inspection shall be made by the senior officer present, who shall make an entry in the log to that effect

79.6 Certificates of inspection Certificates of inspection for any period less than one year shall not be issued, but nothing herein shall be construed as preventing the revocation or suspension of certificates of inspection in case such process is authorized by law

79.6a Exhibition of certificate of inspection On vessels of over 25 gross tons, the original certificate of inspection must be framed under glass and posted in a conspicuous place in the vessel where it will be most likely to be observed by passengers and others On vessels of not over 25 gross tons, the original certificate of inspection must be kept on board to be shown on demand

79.7 Permits to go to other ports for repairs. An Officer in Charge, Marine Inspection, issuing a permit to any vessel to proceed to other ports for repairs shall state upon the face of the same the conditions upon which it is granted and whether the vessel is to be allowed to carry freight or passengers, the quantity and number *Provided, however,* That no vessel whose certificate had expired shall be permitted to carry passengers or freight while en route to another port for repairs

When, under R S 4456 (46 U S C 438), vessels obtain a permit from the Officer in Charge, Marine Inspection, of a district to go from his district to another to make repairs, said Officer in Charge, Marine Inspection, shall notify the Coast Guard District Commander, stating the repairs to be made on said vessels. The Coast Guard District Commander shall notify the Coast Guard District Commander of the district where such repairs are to be made, furnishing him a copy of the report of the inspector indicating the repairs ordered on said vessels.

79 8 Furnishing of drawings of new vessels to inspectors, marking of draft on vessel. On and after July 1, 1930, the owner or builder of every new vessel of over 100 gross tons, before making application for first inspection of the vessel, shall furnish the Officer in Charge, Marine Inspection, of the district where the vessel is to be inspected, drawings or prints, as follows: Sheer, half breadth and body plans, midship section, inboard profile, arrangement of decks and hatch details, capacities of double bottoms and fuel compartments, and such other drawings or prints showing fully the general construction of the vessel (of iron, steel, or wood), including dimensions, spacing of frames, disposition of hull plates, of outside planking and inside ceiling, details of principal scarfs, construction of transverse and longitudinal bulkheads, and location of same.

The drawings or prints and description of the vessel shall be furnished in duplicate to the Officer in Charge, Marine Inspection, making the first inspection, one copy of which shall be forwarded to the Commandant.

All vessels 50 gross tons and over, under the jurisdiction of the Coast Guard, shall have the draft of the vessel plainly and legibly marked upon the stem, and upon the sternpost or rudder post or at such other place at the stern of the vessel as may be necessary for easy observance. The draft shall be taken from the bottom of the lowest part of the keel to the surface of the water; the bottom of the mark to indicate the draft in feet.

79 9 Electrical installations. On all vessels contracted for after June 30, 1928, using electricity for any purpose, the installation shall be in keeping with the best modern practice.

Wires shall be armored or run in approved metal conduits. Metal conduit or armored casing shall be required in bunkers, cargo spaces, storerooms, etc., and in all places where the leads are liable to mechanical injury. Joints in wiring shall be avoided as far as possible in the above-named spaces, and where joints are necessary they shall be made in metal boxes, readily accessible and protected in the same manner as the leads.

When wires are led through beams, frames, or nonwatertight bulkheads, they shall be carried either in metal conduits, armored casing, or protected by hard rubber, or other equivalent bushings.

When wires are carried through watertight decks or bulkheads, they shall be provided with a suitable stuffing box at deck or bulkhead. Where such points are liable to mechanical injury, they shall be protected by suitable boxes or cages.

In locating the wiring system as a whole, care shall be taken to provide accessibility for examination and repair. Special care shall be taken to avoid any arrangement which might permit the lodgment of standing water, and when necessary, openings in conduits or drains shall be installed to accomplish this purpose.

All fixtures, taps, joints, and splices shall be fitted with metal boxes. Boxes in cargo and machinery spaces, galley, and those exposed to weather shall be watertight.

Splices shall be so joined as to be both mechanically and electrically secure without solder. They shall then be soldered and properly insulated and further protected by waterproof tape.

Changes or alterations in the electrical installations of vessels now in service shall be in accordance with this rule.

Special attention shall be given by the inspectors in the examination of present installation to see that it is of such nature as to preclude any danger of fire, giving particular attention to wiring which is carried through wooden bulkheads, partitions, etc

The type of electrical equipment and the types of electric cables to be used in the various parts of vessels constructed after July 1, 1937, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A I E E Standards No 45, October 1930, as published by The American Institute of Electrical Engineers

The type of electrical equipment and the types of electric cables to be used in the various parts of all vessels constructed after January 1, 1939, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A I E E Standards No 45, December 1938, as published by The American Institute of Electrical Engineers

The type of electrical equipment and the types of electric cables to be used in the various parts of all vessels, the contract for the construction of which is signed after June 1, 1941, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A I E E Standards No 45, July 1940, as published by The American Institute of Electrical Engineering

The electrical installation on all existing vessels shall be maintained in good electrical and mechanical condition at all times. Minor replacements of cable and equipment may be made with the same type that was permitted by the regulations at the time the vessel was constructed. Major alterations or major extensions to the electrical installation on existing vessels shall be made in accordance with the rules of this section for new vessels as of the date the contract is made for such alterations or extensions

For vessels the contract for the construction of which was signed prior to September 2, 1945, the specification covering electrical installations titled "United States Coast Guard, Merchant Marine Inspection, Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945,¹ is, during the Unlimited National Emergency, applicable as alternative provisions to those contained in the foregoing parts of this section. For vessels the contract for the construction of which is signed on and after September 2, 1945, those parts of the specification covering electrical installations titled "United States Coast Guard Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945, specified in paragraphs 1, 4, and 5 thereof relating to electric cable are, during the Unlimited National Emergency, applicable as alternative provisions to those contained in the foregoing parts of this section

79.11 Emergency lighting system (a) All vessels engaged in the passenger service, which are electrically lighted by dynamos or other electric units, located below the deep-load line of the vessel, shall have on board an emergency electric lighting system located above the deep-load line to light the vessel sufficiently to enable the passengers and crew to find their way to the exits in the event of failure of the main lighting system. The emergency lighting system shall at all times be ready for immediate use, and shall be installed and arranged so that all emergency lights may be switched on from the pilothouse, navigation bridge, or a central station.

(b) On all passenger vessels contracted for on and after July 1, 1935, or where existing emergency installations operated by internal-combustion engines are replaced, the emergency generator shall be driven by a Diesel or semi-Diesel engine, equipped with means for quick starting. Such emergency equipment shall be located in steel or iron compartments or rooms on the deck above the weather deck and isolated from the passenger and crew quarters. Where existing installations of emergency engines and generators are located in wooden compartments or rooms, such compartments or rooms shall be made fire-resistant

¹ A copy of the specifications is on file in the office of the FEDERAL REGISTER, and copies may be obtained upon request from the Commandant (MMT), United States Coast Guard Headquarters, Washington 25, D. C., or any Coast Guard District Commander

by lining same with asbestos board having a thickness of not less than one-quarter inch over which iron or steel sheathing shall be fitted

79 12 Specifications covering types of voice tubes and telephones—(a) Signals

(1) Steamers using the bell signals between the pilothouse and engine room shall have a tube, of proper size, so arranged as to return the sound of the bell signals to the pilothouse, and shall also be provided with a speaking tube or other device for the purpose of conversation between pilothouse and engine room

(2) Voice tubes or telephone equipment installed on new or existing vessels or fitted as replacements on existing vessels to provide communication between the pilothouse and (i) the emergency steering station, (ii) the steering engine room, and (iii) the engine room, shall conform to the following requirements.

(b) Voice tubes (1) Where the length of voice tube required exceeds 125 feet, or if for other reasons efficient communication cannot be obtained by a voice tube installation, telephone equipment shall be substituted

(2) Where the length of the voice tube as installed is not over 75 feet, the tube used shall be at least 2 inches in diameter Installations having a length of over 75 feet shall be at least 2½ inches in diameter

(3) All voice tubes and voice tube fittings shall be of noncorrodible metal, and flexible tubes or bends shall be used in place of fittings wherever possible Joints in tubing shall be made with white lead and tubes shall be supported at least every 8 feet on straight leads and on bends as required

(4) Voice tubes shall be protected where liable to injury and shall not be run in bunkers, cargo spaces, or through machinery spaces unless unavoidable, and they shall be amply protected by metal or heavy sheathing They shall be provided at the lower end of all risers and in pockets where water can collect with suitable plugs for draining Flexible terminal tubes, where used, shall have an entire metal inner surface Voice tubes should be fitted with elliptical belled mouthpieces with hinged covers, with a whistle indicator on the side of the mouthpiece All voice tubes shall be provided with designating name plates Telephone equipment may in all cases be installed in lieu of voice tubes.

(c) Telephone systems. (1) All telephone transmitters and receivers shall be of sound-powered type designed especially for marine use The Commandant shall approve and list equipment which, if properly installed, will meet the requirements set forth herein The type number and model shall be plainly stamped on the equipment

(2) A call signal shall be provided at each telephone station This signal may be a bell or other sound device which provides a distinctive signal throughout the space where the telephone is installed At installations which are protected by watertight boxes, all signals shall be of such character as to comply with the above when the box is closed Ringers, if located outside the box, must be of watertight construction Installations on new and existing vessels shall be provided with call signals which are actuated by the operation of a magneto generator at the calling station, except that sound powered replacements of battery operated telephone equipment on existing vessels may be provided with battery operated call signals In all cases the calling circuit shall allow any one station to call any other station individually

(3) At each telephone installation a suitable hanger for the handset shall be provided It shall be constructed in such a way as to hold the handset firmly in place and away from the bulkhead The handset shall not be dislodged from the hanger by the motion of the ship or by a severe shock near the mounting

(4) Telephones installed at external locations exposed to the weather or in locations subject to severe moisture conditions shall be enclosed in a substantial, watertight metal enclosure The cover shall be hinged at the bottom or side of the box and, when closed,

shall be fastened by a simple substantial mechanism which, when operated, exerts sufficient pressure to make the enclosure watertight. The gasket shall be fastened to, and inserted in, the edge of the box or cover. The magneto generator and switches shall be of watertight construction. The generator and all switches shall be installed inside the enclosure.

(5) At other locations where a watertight box is not required, the telephone equipment shall be of splash-proof construction and shall be so installed as to minimize possibility of damage by external means. In engine rooms a booth or other suitable auxiliary equipment shall be provided if necessary in order that a telephone conversation can be carried on while vessel is being navigated.

(6) The system shall be installed independent from any other systems of communication or of wiring, but may be extended to cover any other locations which are necessary or desirable. Telephone cable shall be of a type suitable for marine use and shall be run as close to the fore and aft center line of the vessel as possible, and protected from external damage. On passenger vessels where telephone cable must, due to the vessel's construction, run closer than one-fifth of the beam to the side, port and starboard cables shall be provided and connected in parallel. It shall be so installed as to minimize ingress of water and dampness.

(7) The talking circuit shall be electrically independent of the calling circuit. A short or open circuit or a ground on either side of the calling circuit shall not effect the talking circuit in any way.

(d) **Telegraph.** Nothing in the above shall be construed to prevent the use of the so-called telegraph now in use for conveying signals from the pilot house to the engine room, but in all cases where the telegraph is used the signal shall be repeated back.

(e) **Cable traveler.** (See § 78 19 of this chapter.)

(f) **Electrical engine order telegraph systems.** All electrical engine order telegraph systems on vessels, not also equipped with mechanical telegraphs, shall be provided with an alarm, located on the bridge, to indicate visually and audibly the failure of power to the system.

(g) **Engine-room signals.** Signals between engine room and pilothouse, whether they be telegraph, bell, whistle, telephone, or voice tubes, shall be examined and tested at each inspection.

79 14 Whistles. Inspected motor vessels shall be provided with an efficient whistle sounded by steam or by some substitute for steam to give the necessary whistle signals.

79 15 Alarm bells—(a) New vessels. All vessels over 100 gross tons the construction of which is begun on and after September 1, 1943, shall have all sleeping accommodations, public spaces, and machinery spaces equipped with a sufficient number of alarm bells so located as to warn all occupants. The system shall operate from a continuous source of electric energy capable of supplying the system for a period of at least 8 hours without being dependent upon the main, auxiliary or emergency generating plants. Each bell shall produce a signal of a tone distinct from that of other bell signals in the vicinity and shall be independently fused with each of these fuses located above the bulkhead deck. The bells shall be controlled by a manually operated contact maker located in the pilothouse, or, if specific approval is given by the Commandant, in the fire control station. The characteristics of the contact maker shall be such that it possesses

(1) Positive contact

(2) Watertightness (when located in open spaces subject to weather)

(3) Means whereby its electrically open or closed position can be determined by sense of touch

(4) Means to effect a make-and-break circuit for signaling

(5) Self-maintaining contacts

(b) **Existing vessels.** All existing vessels over 100 gross tons and such vessels the construction of which is begun prior to September 1, 1943, shall have all sleeping accom-

modations equipped with a sufficient number of alarm bells so located as to warn all the occupants. The alarm bells, if electric, shall be operated from an open switch from the pilothouse or bridge. The bells shall be of such size, character, and construction, as to provide an alarm throughout the spaces for which they are provided.

79 16 Fog bells The efficient fog bell required upon vessels by law (sec 1, 26 Stat 325, as amended, 33 U S C 91) shall be held to mean a bell not less than 8 inches in diameter from outside to outside and constructed of bronze or brass or other material equal thereto in tone and volume of sound, and located where the sound shall be the least obstructed.

79 17 Posting of instructions for using gun apparatus. A placard containing instructions for using the gun apparatus as practiced by the Coast Guard shall be posted in the pilothouse, engine room, and in the seamen's, firemen's, and stewards' departments of every vessel of 150 gross tons or over subject to inspection of the Coast Guard.

79 18 Use of approved equipment. (a) No lifeboat, lifeboat-disengaging apparatus, life raft, life preserver, fire extinguisher, fire-extinguishing apparatus, or other equipment required to be approved by Title 52, Revised Statutes, shall be used on any vessel inspected and certificated by the Coast Guard which shall not first be approved by the Commandant.

(b) Boilers, pressure vessels, machinery, piping, electrical and other installations, including lifesaving, fire-fighting, and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (sec 501, 56 Stat 180, 50 App Sup, 635), which do not fully meet the detailed requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended. In each instance prior to final action by the Commandant, the Officer in Charge, Marine Inspection, shall notify Headquarters of the facts in the case, together with recommendations relative to suitability for retention.

79 18a Repairs to fire-fighting and lifesaving apparatus. No repairs or alterations, except in emergency, shall be made to any lifeboat, lifeboat-disengaging apparatus, life raft, life preserver, fire-extinguishing apparatus, or other appliance subject to inspection, without advance notice to the Officer in Charge, Marine Inspection. Such repairs or alterations shall so far as is practicable be made with materials and tested in the manner specified within this part for new construction. Emergency repairs or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, in the district where the vessel may call after such repairs are made, nor shall any lifeboat or life raft be reconditioned or used on a steamer other than that for which it was built, without notice to and supervision by the Officer in Charge, Marine Inspection, in the district wherein such reconditioning or repairs are to be made.

79 19 Standard in inspection of hulls, boilers and machinery. In the inspection of hulls, boilers, and machinery of vessels, the rules promulgated by the American Bureau of Shipping respecting material and construction of hulls, boilers, and machinery, and the certificate of classification referring thereto, except where otherwise provided for by the rules and regulations in this subchapter, Subchapter E (Load Lines), or Subchapter F (Marine Engineering), shall be accepted as standard by the inspectors.

79 21 Copies of specifications and/or blueprints. Sixty copies of all blueprints and/or specifications of every article approved after July 1, 1927, for use on vessels subject to inspection shall be supplied to the Commandant for the use of inspectors.

79 21a Passenger accommodations for ferryboats. Ferryboats subject to inspection under Title 52, Revised Statutes, permitted to carry 200 or less passengers shall have at least one toilet and one washbasin for men and one toilet and one washbasin for women located in so-called toilet rooms, in, or adjacent to, passenger quarters.

Such vessels permitted to carry over 200 and not over 500 passengers shall have at least one toilet, one urinal, and one washbasin for men and two toilets and one washbasin for women

For every additional 500 passengers permitted to be carried there shall be one additional toilet or urinal for men and one additional toilet for women

Washbasins to be added in proportion to one additional for every two additional toilets or urinals in the men's room and every two additional toilets in the women's room

The above is applicable to new vessels, also to existing vessels when reasonable and practicable

79.21b Crew accommodations. On all vessels of 100 gross tons and over, the contract for the construction of which is signed after January 1, 1941, there shall be provided at least one toilet, one washbasin, and one shower or bathtub, for each eight members, or portion thereof, in the crew to be accommodated. The crew to be accommodated shall include all members who do not occupy rooms to which private facilities are attached

When the engine room crew, exclusive of licensed officers and others separately provided for, exceeds eight, their toilet and washroom equipment shall be separate from the other crew members. When the steward's department crew, exclusive of those separately provided for, exceeds eight, their toilet and washroom equipment shall be separate from the other crew members. Separate facilities shall also be provided for the female members of the crew

All washbasins, showers, and bathtubs shall be equipped with proper plumbing, including hot and cold running water. Washbasins may be located in the crew sleeping quarters, if properly installed and equipped with proper plumbing. The washrooms and toilet rooms shall be equipped with proper drains

The toilet rooms shall be separate from the washrooms and at least one washbasin shall be fitted in each toilet room. All toilets shall be installed with proper plumbing for flushing. Where more than one toilet is located in a space or compartment, each toilet shall be separated by partitions, which shall be open at the top and bottom for ventilation and cleaning purposes. Toilets shall be provided with seats of the open front type that automatically lift up when not in use. Urinals may be fitted in toilet rooms, if desired, but no reduction in the required number of toilets will be made therefor.

When the total number of the crew exceeds 100, consideration may be given to special arrangements and to a reduction in number of facilities required

On all vessels of 100 gross tons and over, the contracts for the construction of which were signed on or prior to January 1, 1941, the toilet and washing facilities shall be in keeping with the age, size, and service of the vessel and consistent with the principles underlying the requirements for vessels the contracts for the construction of which were signed after January 1, 1941, when reasonable and practicable a minimum of one toilet, one washbasin, and one shower or bathtub for each ten members, or portion thereof, in the crew to be accommodated, shall be provided. On such vessels separate washing facilities are not required where the engine room crew, exclusive of licensed officers and others separately provided for, does not exceed ten

79.21c Passenger accommodations for excursion boats and passenger barges. Excursion boats and passenger barges, permitted to carry 100 or less passengers shall have at least one toilet and one washbasin for men, and one toilet and one washbasin for women, located in so-called toilet rooms, in, or adjacent to, passenger quarters

Such vessels permitted to carry over 100 and not over 300 passengers shall have at least two toilets and one washbasin for men, and two toilets and one washbasin for women. Such vessels permitted to carry over 300 and not over 500 passengers shall have at least three toilets and two washbasins for men, and three toilets and two washbasins for women.

For every additional 500 passengers permitted to be carried on such vessels, there shall be at least one additional toilet for men and one additional toilet for women

Washbasins to be added in proportion to one additional basin for every two additional toilets or urinals in the men's room and one additional basin for every two additional toilets in the women's room

All toilet and washing equipment shall be fitted with running water

Urinals may be substituted for toilets required in the men's department *Provided* That at least one-half of the toilet equipment required in the men's department are toilets

Private bath and toilet equipment rented with individual rooms to passengers shall not be considered a part of the required equipment within the meaning of this rule

Vessels carrying passengers shall have separate toilets and washbasins for crew, located separately from passengers' toilet and washroom equipment space

Where passenger barges are towed alongside, the toilet and washbasin equipment required may be on the towing vessel, provided passengers may pass to and from the towing vessel with safety

The above is applicable to new vessels, also to existing vessels when reasonable and practicable

PART 80—FERRYBOATS

Sec		Sec	
80 1	Navigation limits	80 7	Automobiles or other motor vehicles carried on ferryboats
80 2	Bulkheads		
80 3	Lifesaving equipment		
80 4	Life preservers and fire-fighting equipment		
80 5	Lifesaving and fire-fighting equipment of car-ferry steamers		
80 6	Duty of master of car-ferry steamer		

CROSS REFERENCE

Definition of terms See § 76 01
 Fire prevention, fire apparatus See part 77
 Passenger accommodations for ferryboats See § 79 21a

Section 80 1 Navigation limits. The navigation of ferryboats shall be confined to the ferry routes specified in the certificate of inspection, but such vessels may be permitted to go beyond their authorized routes with passengers only, or, without such permit, to lighten or relieve vessels in distress. When any ferryboat leaves her ferry route and carries passengers, she shall be required to carry the same officers, crew, and equipment as required of other steamers carrying passengers.

80.2 Bulkheads Every new mechanically propelled ferry vessel carrying passengers for hire shall have a sufficient number of transverse watertight bulkheads so that the vessel will remain afloat and have positive stability in the event any one main compartment is flooded.

A forepeak or collision bulkhead shall be fitted and located not less than 5 percent of the length of the ship, and not more than 10 feet plus 5 percent of the length of the ship from the bow, at load water line.

One bulkhead shall be fitted at the forward end of the machinery space (which includes boiler space) and one bulkhead shall be fitted at the after end of the machinery space. Other transverse bulkheads shall be so located as to meet the above requirements of subdivision and stability.

Main transverse bulkheads shall not be stepped, but may be recessed. No recess shall be fitted nearer the vessel's side than one-fifth of the vessel's beam amidships measured at right angles to the center line at the level of the load water line on which the subdivision is based. Bulkheads shall extend to a deck whose distance above the load water line is sufficient to enable the subdivision and stability requirements to be met with a fair margin of safety.

If the distance between two adjacent main transverse watertight bulkheads is less than 10 feet plus 2 percent of the vessel's load water line, only one of these bulkheads shall be regarded as forming a boundary of a main compartment.

In lieu of bulkheading, the Commandant will allow alternative arrangements wherein sufficient buoyancy is supplied by independent air tanks, or other means, to float the vessel when flooded while fully loaded. Such arrangements must be approved by the Commandant in each instance.

Existing mechanically propelled ferry vessels carrying passengers for hire shall comply with the above requirements for new vessels unless it can be shown by the owner to the satisfaction of the Commandant that the application of the requirements is impracticable and unreasonable. (Where the length of trip between terminals is 10 minutes or less, the last paragraph is effective January 1, 1940.)

80 3 Lifesaving equipment All ferryboats of 50 gross tons or over shall be equipped with such lifeboats, life rafts, outside ladders, and other means of escape, in case of disaster, as, in the opinion of the inspectors, shall meet the requirements of each particular case.

But in no case shall the cubic feet of boat capacity be less than that provided in the table following

	<i>Cubic feet</i>
Ferryboats of 50 and not over 300 gross tons.....	120
Ferryboats over 300 and not over 600 gross tons.....	240
Ferryboats over 600 gross tons.....	360

Provided, That on ferryboats of more than 300 gross tons one-half the boat capacity required may be substituted by its equivalent in approved life rafts

Ferryboats of less than 50 gross tons shall be equipped with boats or rafts as in the opinion of the inspectors may be necessary in case of disaster to secure the safety of all persons on board

80.4 Life preservers and fire-fighting equipment. All ferryboats shall be equipped with a life preserver for each person carried, and in addition thereto shall have a number of life preservers suitable for children equal to at least 10 percent of the total number of persons carried. All life preservers shall be distributed in the most accessible places, where they can be reached at all times

All ferryboats shall be provided with the same fire apparatus required on passenger vessels of equal tonnage, except that a fire-detecting and alarm system need not be installed, but a manual sprinkler system shall be installed to blanket the vehicle spaces on all 2-decked ferryboats

80.5 Lifesaving and fire-fighting equipment of car-ferry steamers All car-ferry steamers transporting passengers in cars shall carry the same lifesaving and fire-fighting equipment as required on ferryboats, excepting that the number of life preservers shall equal the number of persons carried

80.6 Duty of master of car-ferry steamer It shall be the duty of the master of any such car-ferry steamer to see that all of the doors of the cars are unlocked and that the vestibules of the cars are open while the cars are on the steamer, to allow the persons so carried free egress at all times

80.7 Automobiles or other motor vehicles carried on ferryboats (a) Automobiles or other motor vehicles shall be stowed in such a manner as to permit both passengers and operators to get out and away from them freely in the event of fire or other disaster. Where there is insufficient clearance to provide for easy egress or ingress at all times, both passengers and operators shall be directed to leave their vehicles and to occupy other spaces reserved for them during the crossing. The decks, where necessary, shall be definitely marked with painted lines to indicate the vehicle runways and the aisle spaces

(b) The master shall take all necessary precautions to see that automobiles or other motor vehicles have their motors turned off when the ferryboat is under way and the motors shall not be started until the ferryboat is secured to the ferry landing

(c) The master shall have appropriate "no smoking" signs posted and shall take all necessary precautions to prevent smoking or carrying of lighted or smoldering cigars, cigarettes, etc., in deck areas assigned to automobiles or other motor vehicles

PART 81—EXCURSION STEAMERS

See

81.1 Permits to engage in excursions

See

81.2 Additional life preservers required

CROSS REFERENCE

Definition of terms See § 76.01

Fire prevention, fire apparatus See part 77

Passenger accommodations for excursion boats See § 79.21c

Section 81.1 Permits to engage in excursions If the master, agent, or owner of any passenger or ferry steamer desires a permit to engage in excursions, the inspectors, upon the written application of such a master, agent, or owner, may issue the same, stating the number of extra passengers the boat may carry with safety, the route she may run, and the kind and extra number of lifesaving appliances with which she is provided. The permit, when used, shall be framed under glass and exposed to the view of the passengers, in connection with the certificate of inspection.

Increases in the passenger allowance of any vessel, whether specified in regular certificate or by excursion permit, may be allowed only after personal inspection of the vessel by the Officer in Charge, Marine Inspection, or by the Coast Guard District Commander if he grants the increase, who shall be satisfied that the vessel and her equipment justify the additional allowance, and of which inspection a written record shall be made and kept in the files of the office granting the allowance and a copy thereof forwarded to the office of the Commandant.

81.2 Additional life preservers required Passenger steamers making excursions shall have, in addition to their regular lifesaving equipments, a life preserver made in accordance with the rules of the Commandant, or their equivalent in other approved lifesaving appliances, for each additional passenger allowed.

PART 82—BARGES

<p>See 82 1 Lifesaving and fire-fighting equipment of open barges carrying passengers 82 2 Lifesaving and fire-fighting equipment of closed barges 82 3 Lifesaving and fire-fighting equipment of barges engaged in excursions 82 4 Equipment of car-carrying barges, duty of master</p>	<p>See 82 5 Fire extinguishers on barges carrying passengers. 82 6 Railing for open barges</p>
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CROSS REFERENCE

Definition of terms See § 76 01
Fire prevention, fire apparatus See part 77
Passenger accommodations for passenger barges, See § 79 21c

Section 82 1 Lifesaving and fire-fighting equipment of open barges carrying passengers Any open or uncovered barge carrying passengers while in tow of any steamer shall carry one life preserver or one float for every person carried, two axes, and a yawl boat or boats of a capacity in the same proportion to the number of persons carried as is required for life-boats on steamers carrying passengers

82 2 Lifesaving and fire-fighting equipment of closed barges Covered barges or barges with inclosed deck or decks shall carry the same equipment as required by § 82 1, except that they shall carry three axes

82.3 Lifesaving and fire-fighting equipment of barges engaged in excursions. Every barge carrying passengers in tow of any steamer and engaged in excursions shall be supplied with one life preserver or one float for every person carried on board, and shall be equipped with three axes, and two yawl boats of not less than 60 cubic feet capacity each, to be carried on deck ready to be launched for immediate use, or towed in such manner as to best afford prompt relief in case of accident or disaster

82 4 Equipment of car-carrying barges, duty of master Any barge in tow of a steamer and used for transporting passengers in cars shall be equipped in accordance with this part, and the master or person in charge of the barge or the master of the towing steamer shall see that all of the doors of the cars are unlocked and that the vestibules of the cars are open while the cars are on the barge, to allow the persons so carried free egress at all times

82 5 Fire extinguishers on barges carrying passengers Every barge carrying passengers while in tow of a steamer shall be equipped with portable fire extinguishers in the same manner as required for passenger steam vessels of the same type and length

82 6 Railing for open barges All open barges carrying passengers shall be inclosed by a good and substantial rail not less than 3 feet high

PART 83—DUTIES OF INSPECTORS

Sec.		Sec.	
83 1	Publication of inspectors' reports	83 10	Reports of accidents
83 2	Reports of Coast Guard District Commanders and Officers in Charge, Marine Inspection	83 12	Carrying of excess steam
83 3	Requests for testimony	83 14	Guards and rails
83 4	Inspection of boilers	83 15	Inclining tests
83 5	Inspection of steam pipes	83 16	Inspection of airports and deadlights
83 6	Entrance of boilers by inspectors	83 17	Inspection of lifeboat-disengaging apparatus
83 7	Location of whistles on floating structures	83 21	Fire-prevention inspection
83 8	Location of steam whistles	83 22	Inspection of quarters
83 9	Testing of boilers and hose		
83 9a	Deep-sea sounding apparatus or shallow water alarm		

CROSS REFERENCE

Definition of terms See § 76 01

Section 83.1 Publication of inspectors' reports Annual reports shall not be made public until after they have been printed and made public by the Coast Guard. No inspector or clerk shall make public any report without the consent of the Coast Guard District Commander or the Commandant of the Coast Guard.

83.2 Reports of Coast Guard District Commanders and Officers in Charge, Marine Inspection (a) It shall be the duty of the Coast Guard District Commanders to inform in writing their respective Officers in Charge, Marine Inspection, of their decisions in cases of appeals.

(b) A Coast Guard District Commander who grants a license to a vessel engaged in towing to carry persons in addition to its crew, under the act approved February 23, 1901 (31 Stat. L. 800, 46 U. S. C. 458, 459), shall notify the Officer in Charge, Marine Inspection, in whose jurisdiction the vessel is to operate, who shall keep a record of the same.

(c) The Officer in Charge, Marine Inspection, shall notify, through his Coast Guard District Commander, the Officers in Charge, Marine Inspection, of adjoining districts of all revocations or suspensions of licenses, the names of all persons from whom licenses have been withheld, the names of all steam vessels neglecting or refusing to make repairs when ordered, and the names of all vessels that have been refused certificates of inspections with the reasons therefor.

83 3 Requests for testimony Whenever any inspector shall find it necessary, in conducting his investigations or in the performance of any of his duties, to obtain testimony from the inspectors of other districts, he shall request the same through the Coast Guard District Commander.

83 4 Inspection of boilers Inspectors, at their annual inspections of steam boilers, may cause to be removed from the surface of such boilers as are covered so much of said covering as may be necessary to enable them to examine parts of the boilers which cannot be properly examined from the inside, and shall examine in a thorough and careful manner, when practicable, either externally or internally, all parts of the shell of every boiler, and the masters, engineers, and owners of every steam vessel shall afford every facility necessary to carry out in the most effective and efficient manner the provisions of this section, and in no case shall an intermediate inspection be deemed any part of the regular annual inspection.

83.5 Inspection of steam pipes It shall be the duty of inspectors when inspecting or reinspectng a vessel to carefully examine all steam pipes passing through woodwork, and if in their judgment the same are deemed unsafe they shall have them provided with air space and fitted with metal collars.

83.6 Entrance of boilers by inspectors It shall be the duty of the inspector who inspects the boilers of any steamer to actually enter the boiler or boilers where it is possible to do so, and to thoroughly examine the interior of all such boilers to see that the braces are in place and of proper size, and to determine whether the boilers are in good condition, before granting a certificate of inspection, such examination to be made after the hydrostatic pressure has been applied. A record shall be made in the inspector's report of inspection showing whether or not the inspector did actually enter the boiler, and if he did not enter the boiler, he shall give his reasons for not entering it.

83.7 Location of whistles on floating structures It shall also be the duty of the inspectors to compel all floating structures, such as steam elevators (propelled by their own motive power), to have their whistles located on the front side of such superstructures having an elevation higher than the pilothouse of the vessels.

83.8 Location of steam whistles All steam whistles shall be placed not less than 6 feet above the top of the pilothouse of steam vessels where the height of the smokestack will admit the attachment of same below its top, when not hinged for passing under bridges, except upon steamers navigating the Red River of the North, Yukon and similar rivers, and rivers whose waters flow into the Gulf of Mexico, and steamers of less than 100 gross tons, whose steam whistles shall be placed not less than 2 feet above the tops of their pilothouses, and all double-end ferry steamers, and steamers similarly constructed, shall have a steam whistle both fore and aft of the smokestack, or one steam whistle on either the starboard or port side of the smokestack, so that the steam, when whistle is blown, can be seen from either end of steamer, and it shall be the duty of inspectors to enforce this section at the annual inspection.

83.9 Testing of boilers and hose. (a) It shall be the duty of inspectors to be present when the boiler is being tested by hydrostatic pressure, and the inspectors shall observe and note the indication upon the gage.

(b) It shall also be the duty of the inspectors to examine all pumps, hose, and other fire apparatus and to see that the hose is subjected to a pressure of 100 pounds to the square inch, and that the hose couplings are securely fastened in accordance with part 77 of this chapter.

83.9a Deep-sea sounding apparatus or shallow-water alarm It shall be the duty of the Officers in Charge, Marine Inspection, to require all passenger or freight steam vessels of 1,500 gross tons and over, navigating the Great Lakes, except paddle-wheel steam vessels, to be equipped with an efficient mechanical deep-sea sounding apparatus, or an efficient shallow-water alarm, in addition to the ordinary deep-sea hand lead. The mechanical deep-sea sounding apparatus or efficient shallow-water alarm above required shall be installed, kept in working order, and ready for immediate use.

83.10 Reports of accidents Officers in Charge, Marine Inspection, shall report forthwith to their Coast Guard District Commanders in detail all accidents of a serious character—such as collisions, foundering, sinkings, fires—and all other casualties of interest to or affecting the Coast Guard in their respective districts.

83.12 Carrying of excess steam. When it is known or comes to the knowledge of the Officer in Charge, Marine Inspection, that any steam vessel is or has been carrying an excess of steam beyond that which is allowed by her certificate of inspection, the Officer in Charge, Marine Inspection, in whose district said steamer is being navigated, in addition to reporting the fact to the United States district attorney for prosecution under R. S. 4437 (46 U. S. C. 413), shall require the owner or owners of said steamer to place on the boiler of said steamer a lock-up safety valve that will prevent the carrying of an excess of steam and shall be under the control of said Officer in Charge, Marine Inspection.

On the placing of a lock-up safety valve upon any boiler, it shall be the duty of the engineer in charge of same to blow or cause the said valve to blow off steam at least once in

each watch of 6 hours or less, to determine whether the valve is in working order, and it shall be the duty of the master of such vessel to see that this section is observed, and it shall be the duty of the master and engineer to report to the Officer in Charge, Marine Inspection, any failure of such valve to operate

In case no such report is made and a safety valve is found that has been tampered with or out of order, the engineer in charge of such boiler and the master of such vessel shall be proceeded against in accordance with the provisions of R S 4450, as amended (46 U S C 239), looking to a suspension or revocation of their licenses ¹

It shall be the duty of the Officer in Charge, Marine Inspection, to send a copy of this section to every steamer in his district when said copies are furnished by the Headquarters

83 14 Guards and rails (a) It shall be the duty of the inspectors when inspecting or reinspectng a vessel to see that all exposed and dangerous places, such as gears and machinery, are properly protected with covers, guards, or rails, in order that the danger of accidents may be minimized, and on vessels equipped with radio (wireless) the lead-ins shall be efficiently incased or insulated to insure the protection of persons from accidental shock. Such lead-ins shall be located so as not to interfere with the launching of lifeboats and life rafts

(b) Effective for new construction outboard rails on passenger decks shall be in at least three courses, including the top, and shall be at least 42 inches high. Inboard rails on passenger decks and all rails on crew decks shall be in at least two courses, including the top, and shall be at least 36 inches high

83 15 Inclining tests When inspectors have any reason to question the stability of any vessel under their jurisdiction, they shall require the owners of the vessel to make inclining tests on such vessel, under the supervision of the Commandant

Every passenger or ferry vessel of 500 gross tons or over, propelled by machinery, and every passenger or ferry vessel intended to carry 50 or more passengers, in either case when making application for first inspection to carry passengers, shall be subjected to an inclining test conducted under the supervision of the Commandant, and the results of the test shall be approved before the vessel shall be certificated

The owner or builder of every vessel described in the second paragraph of this section shall, as soon as possible, furnish the Officer in Charge, Marine Inspection, of the district where the vessel is to be inspected drawings or blueprints, as follows: Sheer, half breadth and body plans, midship section, inboard profile, floors, framing, bulkheads, arrangement of decks and quarters, general arrangement and location of boilers and machinery, plan and elevation, plan and elevation sections through holds, tanks, bunkers, double bottoms, and compartments, capacity plan of the bunkers, tanks, holds, double bottoms, and compartments, and the following curves: Displacement, vertical center of buoyancy, transverse metacenter, longitudinal center of buoyancy, longitudinal metacenter, center of gravity of water planes from either perpendicular, moment to alter trim, and tons per inch, except for double-end ferryboats, then the drawing or blueprint of curves will only be required to show the displacement, vertical center of buoyancy, transverse metacenter, and tons per inch. The drawings and blueprints required by this paragraph shall be forwarded, upon receipt of same, by the Officer in Charge, Marine Inspection, to the Commandant

Where vessels are required to carry fixed ballast, in order to increase the metacentric height, such ballast shall not be moved except for examination and repair of vessel, and then only in the presence of an inspector

The Officer in Charge, Marine Inspection, shall place a notation in regard to the inclining data on the upper right-hand corner of the certificate of inspection of every vessel subject

¹ Attention is called to R S 4437 (46 U S C 413), which makes the obstructing of a safety valve a misdemeanor subject to a \$200 fine and imprisonment for not to exceed 5 years

to this section, to read as follows Data relating to the stability of this vessel is on file at Coast Guard Headquarters, Washington, D C

It shall also be the duty of the Officer in Charge, Marine Inspection, to furnish the master and owner of every vessel under the jurisdiction of the Coast Guard and upon which the question of stability has been determined by Headquarters, a copy of the letter from Headquarters giving the result of the inclining test or investigation of the stability of the vessel The Officer in Charge, Marine Inspection, shall require the master of every such vessel to frame this letter, under glass, and post it in the pilothouse

83 16 Inspection of airports and deadlights It shall be the duty of the inspectors when inspecting or reinspecting vessels to carefully examine all airports and deadlights in the hull, and to satisfy themselves that the same are safe

83.17 Inspection of lifeboat-disengaging apparatus Excluding the emergency boats, not more than one type of disengaging apparatus shall be fitted in the lifeboats of a vessel Such disengaging apparatus as is at present fitted in lifeboats and which has been passed as satisfactory, shall be accepted until replacement becomes necessary

It shall be the duty of the inspectors when inspecting or reinspecting vessels to carefully examine the lifeboat-disengaging apparatus and the blocks and falls thereof and to satisfy themselves that the same are in good condition, and, further, that they shall indicate in Form 840-A at annual inspection the name and record of all lifeboat-disengaging apparatus found, and, if unable to identify such lifeboat-disengaging apparatus by name, they shall within a reasonable time take the matter up with the Coast Guard District Commander of the district in order that such apparatus may be traced for identification and approval record

83 21 Fire-prevention inspection (a) When inspecting oil-burning vessels, either internal-combustion type or steam-driven type, the inspector shall examine the tank tops and bilges in the fireroom and engine room to see that there is no accumulation of oil which might create a fire hazard

(b) The examination of the fire-fighting equipment shall be made by inspectors This applies to fire pumps, hose, chemical fire extinguishers, axes, and steam or gas smothering lines to cargo holds and compartments

(c) The inspectors shall examine the fire-fighting equipment provided for the fireroom and engine room to ascertain if it conforms to the regulations in this subchapter and that it is in good condition for immediate use

(d) At the annual inspection or periodical reinspections, the inspectors shall examine the water-sprinkling system, when fitted, to ascertain if it is in good condition and ready for immediate use

83 22 Inspection of quarters It shall be the duty of the inspector to examine passengers' and crews' quarters to see that they are kept in a sanitary condition and to report any deficiencies

COAST GUARD DISTRICT COMMANDERS AND MERCHANT MARINE ACTIVITIES

District	Title	City	State	Address
1st	Commander, 1st Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do	Boston do do Portland Providence	Massachusetts do do Maine Rhode Island	1400 Customhouse 1300 Customhouse 447 Commercial St 76 Pearl St 409 Federal Bldg
2d	Commander, 2d Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do do do do	St Louis do do Cairo Dubuque Cincinnati Louisville Memphis Nashville Pittsburgh Point Pleasant	Missouri do do Illinois Iowa Ohio Kentucky Tennessee do Pennsylvania West Virginia	232 Old Customhouse 210 Old Customhouse 210 Old Customhouse 425-427 New Post Office Bldg 301 Post Office and Courthouse 748 Federal Bldg 606 Federal Bldg 322 Customhouse 1018 Stahlman Bldg 1216 Park Bldg Post Office Bldg
3d	Commander, 3d Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do	New York do do New London New Haven Albany Philadelphia	New York do do Connecticut do New York Pennsylvania	42 Broadway do do 202 New Post Office Bldg 311 Federal Bldg 313 Federal Bldg 801 Customhouse 2d and Chestnut Sts
5th	Commander, 5th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do	Norfolk do do Baltimore	Virginia do do Maryland	Box 540, New Post Office Bldg do 204 Customhouse 209 Chamber of Commerce Bldg
7th	Commander, 7th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do	Miami do do Tampa Charleston Savannah Jacksonville San Juan	Florida do do do South Carolina Georgia Florida Puerto Rico	Box 378 Coconut Grove Station 500 Professional Bldg 501 Professional Bldg 406 Federal Bldg 32 Customhouse 205 Customhouse 210 Federal Bldg Federal Bldg
8th	Commander, 8th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do	New Orleans do do Mobile Port Arthur Galveston Corpus Christi Houston	Louisiana do do Alabama Texas do do do	382 1/2 Customhouse 313 Customhouse 311 Customhouse 565 Courthouse and Customhouse 410 Bleuwater Bldg 232 Customhouse 919 Jones Bldg 310 Appraisers Store Bldg
9th	Commander, 9th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do do do do	Cleveland do do Buffalo Oswego Detroit Duluth Toledo Saint Ignace Chicago Ludington Milwaukee	Ohio do do New York do do Michigan Minnesota Ohio Michigan Illinois Michigan Wisconsin	1700 Keith Bldg do 1600 Keith Bldg 440 Federal Bldg 205 Federal Bldg 430 Federal Bldg 311 Federal Bldg 402 Courthouse and Customhouse Municipal Bldg Customhouse, 610 Canal St National Bank of Ludington 633 Federal Bldg
11th	Commander, 11th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do	Long Beach do do	California do do	707 Times Bldg 1105 Times Bldg do
12th	Commander, 12th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do	San Francisco do do	California do do	941-K U S Appraisers Bldg 907 U S Appraisers Bldg 227 U S Appraisers Bldg
13th	Commander, 13th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do	Seattle do do Portland Ketchikan	Washington do do Oregon Alaska	New World Life Bldg do do 1005 Falling Bldg Federal Bldg
14th	Commander, 14th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do	Honolulu do do	Territory of Hawaii do do	210 Federal Bldg do P O Box 4010

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TREASURY DEPARTMENT
UNITED STATES COAST GUARD

GENERAL RULES AND REGULATIONS
FOR
VESSEL INSPECTION

Bays, Sounds, and Lakes Other Than the
Great Lakes

(Title 46, C. F. R., Parts 94 to 102, Inclusive)



February 1, 1949

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WASHINGTON, D C , *February 1, 1949*

The "General Rules and Regulations for Vessel Inspection, Bays, Sounds, and Lakes Other Than the Great Lakes," are applicable to merchant vessels subject to Title 52 of the Revised Statutes of the United States (Sections 4399 to 4500, inclusive), and acts amendatory thereof or supplementary thereto

This publication replaces the "General Rules and Regulations for Vessel Inspection, Bays, Sounds, and Lakes Other Than the Great Lakes," dated September 1, 1948, and includes all amendments published in the Federal Register through February 1, 1949. The rules and regulations covering boilers, pressure vessels, and appurtenances (which include castings, piping, valves, mountings, fittings, etc., and the design, construction, installation, and inspection thereof) are contained in a separate publication entitled, "Marine Engineering Regulations and Material Specifications." The rules and regulations relative to the examinations for the issuing of licenses, certificates, raise of grade, etc., and other matters relative to merchant marine personnel, are in a separate publication entitled, "Rules and Regulations for Licensing and Certifying of Merchant Marine Personnel." The rules and regulations governing tank vessels and tank barges are contained in a separate publication entitled, "Tank Vessel Regulations."

General authority over and responsibility for the administration and enforcement of the laws and regulations governing navigation and inspection of merchant marine vessels in the several Coast Guard districts are vested in and imposed upon the Coast Guard District Commanders in charge of such districts.

Shipowners, operators, builders, vessels' operating forces, and other persons affected by the navigation and inspection laws and regulations should familiarize themselves with the provisions contained herein. To this end Coast Guard personnel concerned with the administration and enforcement of these laws and regulations will extend every possible assistance.



J F FARLEY

Admiral, United States Coast Guard, Commandant

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TITLE 46—SHIPPING

CHAPTER I—COAST GUARD, DEPARTMENT OF THE TREASURY

Subchapter I—Bays, Sounds, and Lakes Other Than the Great Lakes: General Rules and Regulations

PART 94—BOATS, RAFTS, BULKHEADS, AND LIFESAVING APPLIANCES

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Section 94.01 Definition of terms. Certain terms used in the regulations in this subchapter are defined as follows

(a) **Commandant.** This term means Commandant of the Coast Guard

(b) **Coast Guard District Commander.** This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspections, enforcement, and administration of Title 52, R S, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(c) **Officer in Charge, Marine Inspection.** This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection district for the performance of duties with respect to the inspec-

tions, enforcement, and administration of Title 52, R S, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(d) **Marine inspector or inspector** These terms mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspections, enforcement, and the administration of Title 52, R S, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder

(e) **Headquarters** This term means the Office of the Commandant, Washington, D C

94.1 Lake, bay, and sound steamers. Under this designation shall be included all steam vessels navigating the waters of any of the lakes, bays, or sounds other than the waters of the Great Lakes

94.2 Lifeboats and life rafts required on steam vessels carrying passengers Steam vessels carrying passengers shall be equipped with lifeboats of sufficient capacity to accommodate at one time all persons on board, including passengers and crew *Provided, however,* That such steam vessels navigating during the interval from the 15th day of May to the 15th day of October, in any one year, both dates inclusive, shall be required to be equipped with lifeboats of only such capacity as will be sufficient to accommodate at one time at least 30 percent of all persons on board, including passengers and crew

Steam vessels carrying passengers and navigating routes lying at all points within a distance of 3 miles from land, or over waters whose depth is not sufficient to entirely submerge the vessel in case of disaster, shall, during the interval from the 15th day of April to the 15th day of November, in any one year, both dates inclusive, be required to be equipped with lifeboats of only such capacity as will be sufficient to accommodate at one time at least 10 percent of all persons on board, including passengers and crew

Steam vessels carrying passengers and navigating the waters of the lakes, bays, and sounds tributary to the Pacific coast, the Atlantic coast south of the thirty-third parallel of north latitude, and the Gulf of Mexico shall be equipped with lifeboats of sufficient capacity to accommodate at one time at least 30 percent of all persons on board, including passengers and crew *Provided, however,* That such steam vessels navigating routes lying at all points within a distance of 3 miles from land, or over waters whose depth is not sufficient to entirely submerge the vessel in case of disaster, shall be required to be equipped with lifeboats of only such capacity as will be sufficient to accommodate at one time at least 10 percent of all persons on board, including passengers and crew

Steam vessels carrying passengers and equipped with wireless telegraphy, navigating in daylight only, and whose routes are at all times within a distance of 10 miles from land, or over waters whose depth is not sufficient to entirely submerge the vessel in case of disaster, shall, during the interval from the 15th day of May to the 15th day of October in any one year, both dates inclusive, be required to be equipped with lifeboats of only such capacity as will be sufficient to accommodate at one time at least 15 percent of all persons on board, including passengers and crew *Provided, however,* That such vessels navigating from the 16th day of October to the 31st day of October, both dates inclusive, shall be required to be equipped with lifeboats of only such capacity to accommodate at one time at least 30 percent of all persons on board, including passengers and crew

Three-fourths of the lifeboat capacity required on lake, bay, and sound steam vessels carrying passengers may be in approved decked lifeboats, life rafts, or approved collapsible lifeboats Approved life floats may be substituted for life rafts on vessels carrying passengers operated south of the thirty-third parallel of north latitude and on vessels carrying passengers operated north of the thirty-third parallel of north latitude during the interval between the 15th day of May to the 15th day of October, in any one year, both dates inclusive

94 3 Lifeboats required on steam vessels of 50 gross tons and over not carrying passengers All steam vessels other than steam vessels carrying passengers, except as otherwise hereinafter provided for, shall be equipped with lifeboats of sufficient capacity to accommodate at one time all persons on board One-half of such equipment may be in approved life rafts or approved collapsible lifeboats

94 4 Lifeboats and life rafts required on vessels of less than 50 gross tons not carrying passengers. All vessels of less than 50 gross tons navigating under the provisions of title 52, Revised Statutes of the United States, not carrying passengers, shall be equipped with lifeboats or life rafts of sufficient capacity to accommodate at one time all persons on board

94 5 Boats and rafts required on fireboats Steam vessels that are used exclusively as fireboats and connected or belonging to a regularly organized fire department shall be required to carry only such boats or rafts as in the judgment of the Officer in Charge, Marine Inspection, or Coast Guard District Commander may be necessary to carry the crew

94 6 Lifeboats and other equipment required on ferryboats and towed passenger barges. Lifeboats and other equipment required on ferryboats are prescribed in Part 98 of this chapter, and on towed passenger barges, in Part 100 of this chapter

94 7 Lifeboat and life raft equipment required on steam yachts Steam yachts shall be required to have lifeboat and life raft equipment as provided for in Part 102 of this chapter

94 8 Lifeboat and life raft equipment required on vessels engaged in harbor towing. Steamers of less than 150 gross tons while engaged exclusively in harbor towing may substitute one or more life rafts for the lifeboats required, when the lifeboats interfere with the practical operation of the steamer and such substitution may be made with safety, it being understood that when such vessel engages in service other than harbor towing she shall be equipped with lifeboats as required by the rules

94 9 Wooden surfboat or seine boat Vessels engaged exclusively in the business of seine fishing or wrecking may substitute a wooden surfboat or wooden seine boat for the lifeboat as described by §§ 94 15-94 17, inclusive, of this chapter, capacity to be determined by § 94 20 of this chapter

94 10 Lifeboats and rafts required on inspected motor vessels All vessels propelled by machinery, other than steam, subject to the inspection laws of the United States shall be required to have the same lifeboat and life raft equipment as steam vessels of the same class and the Officer in Charge, Marine Inspection, shall so indicate in the certificate of inspection. This section shall not apply to such vessels under 50 tons, when navigating in daylight only, and when equipped with air tanks under deck of sufficient capacity to sustain afloat the vessel when full of water, with her full complement of passengers and crew on board, or when properly subdivided by iron or steel watertight bulkheads of sufficient strength and so arranged and located that the vessel will remain afloat with her complement of passengers and crew on board with any two compartments open to the sea

94.11 Working boat. Steamers of 200 gross tons and upward carrying passengers shall have one working boat with life line attached, properly supplied with oars and painter, and kept in good condition at all times and ready for immediate use, in addition to the lifeboats required

94.12 Motor-propelled lifeboats on vessels Any vessel under the jurisdiction of the Coast Guard may be allowed to carry one motor-propelled lifeboat as a part of the lifeboat equipment required on such vessel, except that on vessels carrying more than six lifeboats under davits two of such lifeboats may be equipped with motors

Gasoline may be used for such motors when it is carried only in substantial seamless steel, welded steel, or copper tanks securely and firmly fitted in such lifeboats and located where the greatest safety will be secured

All fittings, pipes, and connections shall be of the highest standard and best workmanship and in accordance with the best modern practice. Storage of gasoline other than in the lifeboats using it shall not be allowed under any circumstances.

In computing the cubic capacity of motor-propelled lifeboats the space required for the engine, boiler, motor, and fuel shall be excluded.

94.13 Equipment for lifeboats. All lifeboats shall be equipped as follows:

(a) **Boathook.** One boathook of clear-grained wood of suitable length but not less than 8 feet long by 1½ inches in diameter.

(b) **Bucket.** One galvanized iron bucket, of about 2 gallons capacity, with lanyard attached.

(c) **Hatchet or ax.** One hatchet attached by a lanyard and readily available for use. All hatchets provided for use on merchant vessels on and after December 1, 1944, shall be of an approved type. Hatchets provided prior to December 1, 1944, may be continued in service provided they are in good and serviceable condition.

(d) **Lantern.** One lantern containing sufficient oil to burn at least 9 hours and ready for immediate use.

(e) **Life line.** A life line, properly secured the entire length of each side, festooned in bights not longer than 3 feet, with a same float in each bight. The life line shall be of a size and strength not less than 12-thread manila rope, and the same float in each bight shall hang to within 12 inches of the surface of the water when the boat is light.

(f) **Life preservers.** Two life preservers.

(g) **Matches.** One box of friction matches in a watertight container and carried in a box secured to the underside of the stern thwart or stowed in the locker.

(h) **Oars.** A full complement of oars, and two spare oars conforming to the following requirements:

Number and length of oars

Length of boat	Minimum number of oars	Spare oars	Rowing oars, minimum length in feet
16 feet and under 18 feet.....	4	2	10
18 feet and under 20 feet.....	4	2	11
20 feet and under 24 feet.....	4	2	13
24 feet and under 28 feet.....	6	2	14
28 feet and over.....	6	2	15

NOTE.—Motor lifeboats and lifeboats fitted with propellers operated by hand shall be equipped with 4 oars and 1 steering oar.

(i) **Painter.** One painter of manila rope not less than 2¼ inches in circumference and of a length not less than 3 times the distance between the boat deck and the light draft.

(j) **Plugs.** Each drain hole, fitted with an automatic plug, shall be provided with two caps attached by chains. Where an automatic plug is not provided for the drain hole, there shall be two plugs attached by chains.

(k) **Rowlocks.** One full complement of rowlocks and two spare rowlocks, each rowlock attached to the boat by a separate chain.

(l) **Steering oar or rudder.** One steering oar with rowlock or becket, or rudder with tiller or yoke and yoke lines.

(m) **Stowage of equipment.** All loose equipment shall be securely attached to the lifeboat to which it belongs.

94.14 How lifeboats shall be carried, davits and cranes required. All lifeboats on vessels carrying passengers shall, if practicable, be carried under substantial davits or cranes,

but if it is not practicable so to carry all the lifeboats required, the remainder shall be stowed near at hand, so as to be easily and readily launched. Such davits, cranes, and necessary gear shall be such as will enable the lifeboats to be lowered to the water in less than two minutes from the time the clearing away of the boats is begun.

Each lifeboat carried under davits shall be provided with two separate davits. When a single crane is properly adapted to lower a lifeboat, it may be allowed to take the place of the two davits. Such davits or cranes, and the blocks and falls thereof, on all passenger vessels except ferryboats, shall be of sufficient strength to carry the boat with its full load.

All steam vessels, other than steam vessels carrying passengers, shall be equipped with davits or other practicable means for launching the lifeboats. Mechanical davits, when installed on steam vessels not carrying passengers, shall be subject to all the tests required by this section.

No type or make of mechanical or gravity davit shall be used unless it has first been approved by the Commandant.

No mechanical davits of a character which require manual or other power to turn the boats out to the position for lowering into the water shall be fitted on any vessel the keel of which is laid after September 1, 1941, if such davits are to handle a lifeboat which, without its complement of persons on board, but having on board all air tanks and other lifeboat equipment, exceeds 5,000 pounds total weight, i. e., 2,500 pounds for a single davit arm. An exemption to this requirement may be granted during the period of the national emergency proclaimed by the President on May 27, 1941, if evidence is presented to the Commandant to substantiate a claim that compliance with this requirement would materially delay the completion and delivery of the vessel.

Davits of an approved type, which are capable of swinging the boats into the lowering position without the application of any effort or external force other than that necessary to operate the releasing mechanism, allowing the boat to move from the stowed position to the lowering position by the force of gravity, shall be provided to handle all lifeboats the total weight of which, including air tanks and lifeboat equipment, but without the complement of persons on board, exceeds 5,000 pounds.

Where steel castings are used for davit frames or davit arms this material shall be fully annealed and comply with the following requirements:

(In substantial agreement with A S T M Spec A-27-42 and A-215-41)

Tensile strength min psi.....	66,000
Yield point min psi.....	33,000
Elongation in 2 inches min percent.....	22
Reduction of area min percent.....	33

Chemical composition for castings not intended to be fusion welded

(In substantial agreement with A S T M Spec A-27-42)

Manganese max percent.....	1.00
Phosphorus max percent.....	0.05
Sulphur max percent.....	0.06

Chemical composition of castings intended to be fabricated by fusion welding.

(In substantial agreement with A S T M Spec A-215-41)

Carbon max. percent.....	0.30
Manganese max percent.....	0.70
Phosphorus max. percent.....	0.04
Sulphur max percent.....	0.06
Silicon max percent.....	0.50

For each reduction of 0.01 percent below the maximum specified carbon content, an increase of 0.04 percent manganese above the specified maximum will be permitted up to a maximum of 1.00 percent.

Where structural steel is used for the fabrication of davit frames or davit arms the material shall conform to the following requirements

(In substantial agreement with A S T M Spec A-131-39 and A-7-42)

Tensile strength psi.....	60,000 to 72,000
Yield point min psi.....	0 5 T S
Elongation in 8 inches min percent.....	1,500,000
	Ten Str
Elongation in 2 inches min percent.....	22

Where welding is employed in the construction of davits, the welder shall be qualified by the Coast Guard

All moving parts of davits shall be provided with bushings of nonferrous metal, roller or ball bearings properly lubricated

An inspector shall be present at the foundry where castings are made to witness the tensile and bend tests prescribed. The manufacturer shall furnish an affidavit stating that the required tests for annealing have been made. When the inspector has satisfied himself that such castings comply with the requirements, he shall stamp the davit arm and frame with the letters U S C G, the initials of his name and the letters F T, and date of inspection.

Each davit and frame shall be tested for strength and operation at the place of manufacture in the presence of an inspector.

All mechanical and gravity davit arms or frames shall be tested at the extreme outboard position by suspending from the eye or end of each davit arm a weight equal to the weight of the fully loaded and equipped boat (including full complement of persons at 165 pounds each) for which the davit is to be approved, plus 10 percent. Under this test, a davit arm or frame shall show no permanent set or undue deflection. While this test is being conducted, the frame and arms, if of cast material, shall be subjected to a test by being hammered to satisfy the inspector that the castings are sound and without flaw.

While this test load is suspended, the operating gear of mechanical davits shall be tested by being operated from inboard to the extreme outboard position with the same operating crank or device used in actual practice aboard ship.

The manufacturer shall affix to the davit arm and frame a heavy plate giving the name of manufacturer, date of inspection, serial number, capacity load, space for the inspector's initials, and the letters U S C G. After the inspector has satisfied himself that the assembled installation meets the requirements, he shall stamp the manufacturer's plates with his initials. Each set of davits shall be marked with identical serial numbers by the manufacturer.

No davit arm or frame comprising mechanical or gravity davits shall be placed on board any vessel until all of the requirements of the rules of this section have been fully complied with. Whenever mechanical or gravity davits or parts of davits, such as davit arms, or frames, are installed on vessels to take the place of davits, davit arms, or frames which have become damaged or broken, such davits or frames shall have the manufacturer's name plate affixed thereto.

94 14a Mechanical means for lowering. (a) On all passenger vessels where the height of a boat deck exceeds 20 feet from the lightest seagoing draft, wire falls and mechanical means for lowering shall be provided for each set of davits (Applicable only to vessels constructed after July 1, 1938)

(b) Winches, proposed for use in new installations, shall be of approved type and those which are contracted for on or after January 1, 1942, shall, in addition to conforming to the following requirements, be subjected to the shop test with a 100 percent overload and opened up for examination prior to the Commandant's approval.

(c) Plans and detail specifications of all lifeboat winches shall be submitted by the

manufacturer to the Commandant for type approval. The plans shall show dimensions of all parts and complete bill of material used in the construction of the winches. Where welding is employed in the construction of lifeboat winches the welders shall be qualified by the Coast Guard.

(d) Inspection openings shall be provided in the winch housing or the housing shall be so arranged to permit examination. Screws, bolts, nuts, pins, etc., used in the internal and brake assemblies, shall be fitted with lock washers, cotter pins, or suitable backing stops.

(e) Worm gears, spur gears, or a combination of both may be used in the construction of the lifeboat winches. All gears shall be machine cut and constructed of steel, bronze, or other suitable materials. The use of cast iron for gears is not permitted. Gears shall be press-fitted on the shaft, and keys shall be properly fitted and secured.

(f) Motor clutches, when used, shall be of either frictional or positive engaging type. When one motor is used for two winches, the clutch shall be so arranged that only one winch shall be engaged at any one time. The clutch operating lever shall be capable of remaining in any position when subject to vibration, and shall be so arranged that when in neutral position both lifeboats may be lowered simultaneously.

(g) Winch drums for gravity davits shall be designed with grooves so that not more than one layer of the falls winds on the drum. Drums shall be so arranged as to keep the falls separated. The design shall also provide that the falls will be paid-out at the same rate.

(h) Winch drums for mechanical davits shall be designed with a minimum diameter of 16 times the diameter of the falls.

(i) All drums shall be properly flanged and the falls securely fastened. The use of connecting devices between the drums shall not be permitted unless bolted locking mechanism is provided.

(j) Each winch shall be provided with two brakes, one of which shall be a hand brake, the other a governor brake to automatically control the lowering speed of the lifeboat. The hand brake shall be arranged with a lever and counterweight so that when the lever is raised the brake is released and when the lever is lowered the counterweight will set the brake. The governor brake shall be designed so as to insure that the maximum rate of lowering consistent with safety is not exceeded, this, in general, shall not exceed one hundred feet per minute. External brake bands shall be made of corrosive-resistant metal suitably lined. Internal brakes may be of the metallic shoe type. The brake drums shall be of steel.

(k) Bearings, gears, and other working parts shall be designed for and provided with positive means of lubrication. Worm gears shall operate in an oil bath. Means shall be provided so that the oil level in the gear casings may be checked. Manufacturers shall furnish a lubrication chart for each type of winch.

(l) Winches shall be designed so that they will operate by gravity when lowering. When vessels are fitted with nested lifeboats, special arrangements shall be provided to prevent boat falls from fouling on the drum when they are being recovered and means shall be provided for quick recovery of the falls by hand.

(m) Boat winches shall be provided with means so that the falls may be overhauled by hand. These means must be in addition to hand cranks, and may consist of a hand grab rim on the brake shaft or brake drum.

(n) Where power-driven winches are used with gravity davits, positive means of automatically cutting off the power to the winch shall be fitted to stop the travel of the lifeboat and cradle before reaching final stowed position, to prevent damage to installation.

(o) Where power-driven winches are used with other type davits, the positive means for controlling power to the winch shall be by a master switch or controller so arranged that the operator must hold the master switch or controller in the "on or hoist" position for hoisting, and when released will immediately shut off the power.

(p) Every winch shall be fitted with a name plate of noncorrosive material, giving the maximum load approved, the date the winch was passed, the type, serial number, and the manufacturer's symbol. This plate is to be stamped with the inspector's initials, and the letters, U S C G.

(q) Suitable covers shall be provided, so fitted that ice formation may be readily broken adrift when necessary to operate the winch.

(r) Shop test. Each winch shall be subject to the following test:

(1) Winches shall be set up to simulate a ship installation.

(2) Winches shall be capable of lowering, without undue strain or distortion, a test weight of 10 percent overload, based on the weight of the largest boat the winch is intended to handle, together with regular equipment and full number of persons (165 pounds for each person). The number of parts to the fall should be recorded.

(3) Brake shall be capable of stopping and holding the test weight at any point by the action of the counterweight alone.

(4) While the weight is being lowered through a range of not less than 20 feet, stops shall be made at intervals of several feet. Brakes exposed to the weather shall also be tested under the load lowering condition with the braking surface wetted.

(5) Winch must be capable of limiting the speed of lowering. This should not in general exceed 100 feet per minute.

(s) Installation tests. Upon completion of the installation of all mechanical means for lowering lifeboats, and before the vessel is certificated for service, the following tests and examinations shall be made in the presence of an inspector:

(1) Swing lifeboat out from chocks and lower to level for loading, at which point lifeboat shall be loaded with dead weight equivalent to the number of persons allowed (165 pounds per person) together with weight of equipment, plus 10 percent of the total load. The boat should then be lowered to water, stopping at approximately 6-foot intervals by action of the counterweight alone. During this test the following observations should also be made:

(i) Brake action shall be smooth, but positive. Brakes exposed to the weather shall also be tested under the load lowering condition with the braking surface wetted.

(ii) Counterweight shall be capable of stopping and holding boat when released.

(iii) Winch shall be capable of controlling the speed of lowering. This should not in general exceed 100 feet per minute.

(iv) No part of lowering gear shall show any distress under load.

(v) Deck under winch and davits must be of sufficient strength to prevent any undue stress of the deck under load.

(vi) Mechanical davits shall swing to extreme outboard position without slacking winch brake.

(vii) Action of governor brake and lowering speed permitted by same should be noted.

(viii) Determine that falls are of sufficient length to lower lifeboats to light load line with vessel listed to 15° either way.

(2) If nested boats are used, the hand operated quick recovery mechanism shall be tested and the action must be easy enough to permit one man to recover falls.

(3) A report of the results of the installation tests covering all the above points shall be recorded.

94 15 Drawings, specifications, name plate. (a) All lifeboats shall be substantially constructed in accordance with drawings, or blueprints, and specifications approved by the Commandant. The approval of lifeboat shall include the arrangements for stowage of all equipment.

(b) Builders of lifeboats shall furnish the Coast Guard District Commander of the district in which the lifeboats are built drawings, or blueprints, and specifications showing and explaining the construction of same, and showing the tensile strength and ductility of the metal used. Lifeboats may be constructed of steel having a minimum tensile strength not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches, or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved metals. Where steel is used and the minimum thickness of the metal is less than No 16 B W G, the elongation shall not be less than 15 percent in a gage length of 8 inches.

(c) Builders of lifeboats shall affix a plate of brass or the equivalent to each lifeboat, having thereon the builder's name, number of boat, date of construction of boat, cubical contents of boat, and number of persons said boat will carry, as determined by the rules of the Commandant.

94 16 Inspection of lifeboats when built. Coast Guard District Commanders of districts where lifeboats are built shall detail an inspector to any place where lifeboats are being built, whose duty it shall be to carefully inspect and examine the construction of such lifeboats, and he shall satisfy himself that such lifeboats are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders. When the inspector approves the construction of the boat, he shall stamp his initials, together with the letters "U S C G," on a blank space on the plate required to be affixed to the boat by the builder. The initials of the inspector shall be satisfactory evidence to all parties interested that the boat has been constructed in accordance with the drawings, or blueprints, and specifications on file.

94.17 Construction of metallic lifeboats for lake, bay, and sound steamers. All metallic lifeboats for lake, bay, and sound steamers shall be constructed in accordance with the following specifications:

(a) The keels, stems, sternposts, gunwales, and nosings shall be of clear-grain sound oak or other suitable wood, each in one length, except that the gunwales and nosings may be made in two lengths. When made in two lengths the gunwales shall be scarfed with a good long bevel scarf stiffened on the underside by a piece of gunwale material at least 2 feet in length, $1\frac{1}{2}$ inches thick, and the width of the gunwale.

(b) The stem of each boat shall be of a natural or steam crook, scarfed at least 9 inches in length on the keel and fastened thereto with two $\frac{3}{4}$ -inch through clinch bolts driven through deadwood fitted on the inside.

(c) Each sternpost shall be stepped over the end of the keel half the length of sternpost and recessed at least $2\frac{1}{2}$ inches deep into keel, the whole to be secured on the inside by a crook or knee of sufficient width to receive the flanges of the shell plates.

(d) Each joint of the stem and sternpost shall be fitted with two $\frac{3}{4}$ -inch stopwaters under the shell flanges. Stem and sternpost shall be bearded to not less than $1\frac{1}{2}$ inches.

(e) The flanges of shell plates on boats not over 20 feet long shall lap on the keel, stem, and sternpost at least $2\frac{1}{4}$ inches, on boats over 20 feet and not over 24 feet long, at least $2\frac{1}{2}$ inches, and on boats over 24 feet long, at least $2\frac{3}{4}$ inches, to be fairly drawn up and nailed over a strip of No 6 cotton duck the width of the flanges, which shall be secured by three rows of galvanized nails driven zigzag. No part of the keel, stem, or sternpost outside of the shell flanges shall be covered with sheet metal.

(f) In boats not over 20 feet long the nails shall be driven zigzag on lines $\frac{3}{4}$, $1\frac{1}{4}$, and $1\frac{1}{2}$ inches, respectively, from the edge of the flanges and pitched $1\frac{1}{4}$ inches. In boats over 20 feet and not over 24 feet long the nails shall be driven on lines $\frac{3}{4}$, $1\frac{1}{4}$, and $2\frac{1}{4}$ inches, respectively, from the edge of the flanges and pitched $1\frac{1}{4}$ inches. In boats over 24 feet long the

nails shall be driven on lines $\frac{1}{2}$, $1\frac{1}{2}$, and $2\frac{1}{2}$ inches, respectively, from the edge of the flanges, and pitched $1\frac{1}{2}$ inches

(g) In boats not over 20 feet long the nails shall be not less than $1\frac{1}{4}$ inches long, No 10 B W G In boats over 20 feet and not over 24 feet long the nails shall be not less than 2 inches long, No 10 B W G In boats over 24 feet long the nails shall be not less than $2\frac{1}{2}$ inches long, No 9 B W G

(h) Metallic lifeboats of a length not over 20 feet shall be constructed of plates of not less thickness than No 18 B W G Boats over 20 feet and not over 24 feet long shall be constructed of plates of not less thickness than No 16 B W G Boats longer than 24 feet shall be constructed of plates of not less thickness than No 14 B W G

(i) All seams and joints shall be properly double riveted The seams and butt laps shall lap at least $1\frac{1}{4}$ inches

(j) The center of the row of rivets nearest the edge of a sheet shall be about three-eighths of an inch from the edge Rivets shall be staggered with not less than 18 rivets to the foot, and shall have countersunk heads The diameter of shank of rivets shall be not less than No 10 B W G

(k) The keels, stems, and sternposts shall be not less than the following sizes

Length of boat	Width of keel, stem, and stern-post	Depth of keel, stem, and stern-post
	<i>Inches</i>	<i>Inches</i>
Not over 18 feet.....	1 8	4 2
Over 18 and not over 20 feet.....	2 0	5 0
Over 20 and not over 21 feet.....	2 1	5 0
Over 21 and not over 22 feet.....	2 2	5 0
Over 22 and not over 23 feet.....	2 3	5 0
Over 23 and not over 24 feet.....	2 4	5 0
Over 24 and not over 25 feet.....	2 5	5 0
Over 25 and not over 26 feet.....	2 6	5 0
Over 26 and not over 27 feet.....	2 7	5 0
Over 27 and not over 28 feet.....	2 8	5 0

(l) The keels of all boats over 26 feet long shall be strengthened by the addition of a main keelson extending not less than two-thirds the length of the boat and having one-half the area of the main keel, to which it shall be through fastened with $\frac{3}{4}$ -inch clunch bolts spaced not more than 14 inches

(m) Steel having one-sixth the sectional area of wood found by the above table may be used in lieu of wood for keels, stems, and sternposts of metallic lifeboats All steel keels, stems, and sternposts shall be painted with two coats of red lead and oil

(n) The shell plates shall be riveted to the steel keels, stems, and sternposts, with buttonhead rivets of not less than three-sixteenths inch in diameter for boats less than 24 feet in length, not less than one-fourth inch in diameter for boats of 24 feet up to and including 27 feet in length, and not less than five-sixteenths inch in diameter for boats from 28 feet up to and including 30 feet in length The rivets shall be staggered not less than 12 rivets to the foot

(o) The shell plating attached to the steel keels, stems, and sternposts shall be laid over flannel or felt and red lead to insure watertightness Any form of joint insuring the same result may be approved by the Coast Guard District Commander of the district in which the lifeboat is built Where welding is employed in the construction of lifeboats, the welders shall be qualified by the Coast Guard.

(p) The size of gunwales shall be of not less than the following dimensions

Length of boat	Depth of gunwale	Width of gunwale
	<i>Inches</i>	<i>Inches</i>
Not over 18 feet -----	1 $\frac{1}{4}$	2
Over 18 and not over 20 feet -----	1 $\frac{1}{4}$	2 $\frac{1}{4}$
Over 20 and not over 22 feet -----	2	2 $\frac{1}{4}$
Over 22 and not over 24 feet -----	2 $\frac{1}{4}$	2 $\frac{1}{4}$
Over 24 and not over 26 feet -----	2 $\frac{1}{4}$	2 $\frac{1}{4}$
Over 26 and not over 28 feet -----	2 $\frac{1}{4}$	2 $\frac{1}{4}$

The gunwales of boats not over 22 feet long shall be attached to the thwarts by steel braces at least 1 $\frac{1}{4}$ inches wide by five-sixteenths of an inch thick, teed 4 inches on the thwarts and secured thereto by two $\frac{1}{4}$ -inch carriage bolts, and to the gunwales by a $\frac{1}{2}$ -inch bolt clunched over the plate on the outside. In boats over 22 feet long such steel braces shall be at least 1 $\frac{1}{2}$ inches by three-eighths of an inch, teed 5 inches on the thwarts and secured thereto by three $\frac{1}{4}$ -inch carriage bolts, and to the gunwales by $\frac{1}{2}$ -inch bolts clunched over the plate on the outside. All sheer plates shall come up on the gunwale to within one-half inch of its top and be nailed thereto with 1 $\frac{1}{4}$ -inch boat nails spaced 6 inches. Angle-bar steel gunwales may be used for all lifeboats when the cross-sectional area of the same is of at least one-sixth the cross-sectional area of the wooden gunwale as now specified and required, subject to the suspension test required of lifeboat when loaded with its full complement of persons and equipment.

(q) All nosings shall be formed of so-called half rounds, mitered to fit fairly against the gunwales and sheer plates, through which they shall be nailed to the gunwales every 6 inches with wire nails of No. 10 gage and not less than 2 $\frac{1}{4}$ inches long. The flat side of nosings on boats of not over 20 feet long shall be not less than 1 $\frac{1}{4}$ inches wide and five-eighths of an inch thick. On boats over 20 feet and not over 24 feet long the flat side of the nosing shall be not less than 1 $\frac{1}{4}$ inches wide and 1 inch thick through the round. On all boats over 24 feet long the flat side of the nosing shall be not less than 2 $\frac{1}{4}$ inches wide and 1 inch thick through the round.

(r) All thwarts shall be made of clear yellow pine or fir.

(s) In boats not over 20 feet long thwarts shall be at least 1 $\frac{1}{4}$ inches thick by 7 $\frac{1}{2}$ inches wide. In boats over 20 feet and not over 24 feet long they shall be at least 1 $\frac{1}{4}$ inches thick by 8 inches wide. In boats over 24 feet long they shall be 1 $\frac{1}{4}$ inches thick by 9 inches wide. All thwarts over 4 $\frac{1}{2}$ feet long shall be supported by stanchions of pine of 1 inch by 5 inches. Every thwart shall be secured at each end to the boat by a double or U flange of No. 16 plate riveted to the shell with five rivets. The thwarts shall be pushed in between those flanges and secured thereto by five boat nails driven down through the upper flanges, thwarts, and lower flanges, and turned over beneath.

(t) Breasthooks formed of steel for boats not over 20 feet long shall be $\frac{1}{4}$ inch thick and 1 $\frac{1}{4}$ inches wide. In boats over 20 feet and not over 24 feet long such hooks shall be $\frac{3}{8}$ of an inch thick by 1 $\frac{1}{4}$ inches wide. In boats over 24 feet long such hooks shall be $\frac{1}{2}$ of an inch thick by 1 $\frac{1}{4}$ inches wide. No breasthooks shall be less than 9 inches long. Breasthooks shall be fastened through the gunwales each side with three one-fourth-inch buttonhead bolts clunched over the shell plate. All such breasthooks shall be upset in the throat sufficient to allow the upper bolt through the ring strap to pass through the hook without reducing the sectional area thereof.

(u) The midship footings in boats not over 18 feet long shall be not less than seven-eighths of an inch thick and have two footings on each side, which footings shall be seven-eighths of an inch thick by 7 and 5 inches wide, respectively. The midship footings in boats over 18 feet and not over 24 feet long shall be not less than 1 inch thick by 12 inches wide and have three footings on each side, which shall be 1 inch thick by 7, 6, and 4 inches, respectively, in width. The midship footings in boats over 24 feet and not over 26 feet long shall be not less than 1 inch thick and 12 inches wide, and such boats shall have not less than three footings on each side, each to be not less than 1 inch thick by 7, 6, and 4½ inches, respectively, in width. Boats over 26 feet long having a keelson shall have three footings on each side 1 inch thick by 8, 6, and 5 inches, respectively, in width. All said footings shall be fitted fairly to the bottom over a coat of lead paint and held in place by straps of No. 18 plate, 1½ inches wide, riveted with four rivets to the boat shell. The strap shall pass up through an aperture in the middle of each footing and receive a toggle of gas pipe five-eighths of an inch in diameter and of a length not less than two-thirds of the width of the footing. There shall be not less than four such toggles in each footing in boats not over 20 feet long, nor less than five such toggles in boats over 20 feet and not over 24 feet long. In boats over 24 feet long there shall be six such toggles in each footing. The midship footings shall be secured to the bottom by straps and toggles in two rows placed 3 inches from each edge of the footing, and fastened with toggles of one-half inch pipe 3½ inches long. Hardwood toggles may be used in lieu of pipe when the same are formed of oak of so-called half rounds, 1 inch on their flat side and three-fourths of an inch thick. Iron or steel of so-called half round not less than five-eighths of an inch on the flat side and not less than three-sixteenths of an inch thick may also be used for toggles.

(v) The tackle rings in boats not over 18 feet long shall be formed of not less than five-eighths-inch round steel. In boats over 18 feet and not over 22 feet long such rings shall be formed of not less than three-fourths-inch round steel. In boats over 22 feet and not over 26 feet long such rings shall be formed of not less than thirteen-sixteenths-inch round steel. In boats over 26 feet long such rings shall be formed of not less than seven-eighths-inch round steel. Such rings shall be welded through eyes of equal strength in the ring straps, which straps shall have a sectional area on each side of the upper bolt hole equal to that of the ring, and the sectional area of strap on each side of the next bolt hole shall be two-thirds that of such ring, and on each side of the next row of bolt holes one-half that of such ring. Hooks may be allowed in lieu of rings when constructed of equal strength to rings and attached to the boat as securely as the rule provides for rings. Each and every lifeboat shall be fitted with a painter ring properly secured, of a size and strength not less than that specified for tackle rings. The pitch of bolt holes in all such straps shall be 3 inches. In boats not over 18 feet long said ring straps shall be secured with three bolts one-half inch in diameter. In boats over 18 feet and not over 22 feet in length such ring straps shall be secured by three bolts five-eighths inch in diameter. In boats over 22 feet and not over 26 feet long such ring straps shall be secured by four bolts five-eighths inch in diameter. In boats over 26 feet long such ring straps shall be secured by five bolts, the upper two of which shall be five-eighths inch in diameter and the other three nine-sixteenths inch in diameter. The two upper bolts shall be driven through and clinched on the outer edge of the stem and sternpost. The lower bolt or bolts may be driven blunt 3½ inches into the stem and sternpost. The upper bolts shall pass through the breasthooks.

(w) All boats shall be fitted with rudders made of clear, straight-grained oak or fir, which shall be stiffened across the bottom edge by a piece of wood of the same character, properly nailed.

(x) All gudgeons and pintles shall be strapped to the wood and through fastened, and be so adjusted that the lower pintle will project at least 1½ inches more below its gudgeon than does the upper one.

(y) Each lifeboat shall be fitted with an automatic plug. All the shell plates, air tanks, nails, gunwale braces, rudder braces, and fastenings of metallic boats shall be galvanized when said parts are made of steel or iron.

(z) The gage numbers referred to in this part are the Birmingham standard (B W G.)

9418 Construction of wooden lifeboats—(a) Materials. The timber shall be of the best quality, well seasoned, free from sapwood, shakes, and objectionable knots. The other materials shall be the best of their respective kinds.

(b) **Framings.** Keels, stems, sternposts, aprons, and deadwoods shall be oak or elm with no short grain or shakes. Parts having considerable curvature shall be oak or hackmatack grown to form. The stem and sternpost are to be rabbeted to take the plank ends and form an efficient stop for the caulk. The depth of the rabbet shall not exceed the thickness of the plank. Aprons shall be of sufficient size to insure a 3-inch faying surface and receive the double fastenings of the hooded ends. Deadwoods are to be of the same size as the keel and are to scarph properly with the apron and keelson. The timbers are to be checked into the deadwoods and cavities filled with marine glue to form a water course. Keel and hog piece shall be elm or oak, and the keel shall be in one length. Scarphs connecting the stem and sternpost to the keel may be either vertical or horizontal. The vertical scarphs shall be secured by five clinched nails, and the horizontal or flat scarphs shall be properly lipped and secured by at least two through fastenings. Ordinary tenons shall not be accepted as equivalent to scarphs. Stem bands shall be galvanized wrought iron and extend from the breasthook over the stem head to keel plate or 2 feet abaft the scarph.

(c) **Planking.** The planking may be of the clincher, carvel, or multiple-skin types, the carvel and double plank to be recommended, especially the latter when for use on vessels in tropical trades. In clincher-built boats the extreme breadth of the plank is not to exceed $5\frac{1}{2}$ inches, except in the four strakes next to the keel, which may be as follows: two at 7 inches, one at $6\frac{1}{2}$ inches, and one at 6 inches. In boats 18 feet in length and under, these breadths may require to be reduced about an inch. The landings shall not be less than seven-eighths inch in breadth. The planks should be in as long lengths as possible, with an efficient shift of butts. There shall be at least two passing strakes between butts in the same timber space.

(d) **Timbers.** Timbers shall be elm or oak bent to shape and fitted in one length from gunwale to gunwale, except in the extreme ends of the boats. The spacing of timbers shall not exceed 6 inches center to center.

(e) **Stiffeners.** Keelsons shall be in one length and overlap the deadwoods so as to take all the fastenings of the lifting plates. A substantial hardward chock shall be well secured to the keelson to form a mast step, the keelson shall not be cut for the purpose. The bilge stringers and risings should be in as long lengths as possible, properly scarphed at the butts, and either through fastened at each timber or fastened at each timber with a brass screw. In boats 25 feet in length and over, the heads of the timbers are to be carried up and connected through the sheer strake and gunwale. In all boats, provisions shall be made for double-banking the oars.

(f) **Thwarts and stanchions, etc.** The number of thwarts shall not be less than given by the following:

Lifeboats, length in feet	Number of thwarts
18 and under.....	4
Over 18 and not over 24.....	5
Over 24 and not over 28.....	6
Over 28 and not over 30.....	7

The distance of the top of the thwarts below the top of the gunwale shall be as follows

Lifeboats, length in feet	Inches
22 and under.....	9
Over 22 and not above 28.....	10
Over 28 and not above 30.....	11

The thwarts shall be scored over the timbers and directly attached to the risings by means of 2 screws at each end. In all boats where the unsupported length of the thwarts exceeds 5 feet, stanchions well connected to the thwart and to the side of keelson shall be fitted. The side benches shall be continuous and fitted in as long lengths as possible, they shall not be removable, but form part of the permanent structure of the boat. In boats over 20 feet in length where lower cross or side seats are required to be fitted, they are to be well secured and supported. They shall be placed as low as practicable. Stretchers or lower cross seats of sufficient size and strength are to be fitted in suitable positions for the efficient rowing of all boats. All lower seats and bottom boards are to be made readily portable, and so arranged that the plugs are at all times directly accessible without removing any fitting. The plug chains are to be securely attached to the boat by screws.

(g) **Thwart knees** The knees shall be of wrought or stamped iron, galvanized, 1½ inches thick at the thwart. In lifeboats over 24 feet in length, the knees shall be double, but, in lieu thereof, iron knees of special design may be adopted. The knees shall be connected to the side of the boat and to the thwarts by at least 2 through fastenings in each arm. Nut and screw bolts are recommended for the purpose. The bolts should be cup-headed and the nuts have iron plate washers on the under side of the thwarts. Any additional fastening may be stout screws, but spike or wire nails are not to be allowed. A hardwood chock 3 inches wide should be fitted between knee and side of boat to receive knees and fastenings of sheer strake. Where wood knees are preferred they should be of oak, ash, elm, or hackmatack grown to form. The fastenings may be galvanized iron, but wire nails shall not be allowed.

(h) **Breasthooks** The sides of the boat at the ends shall be well bound together across the middle line, the breasthooks being of sufficient number and size, having regard to the dimensions and form of the boat. The arms are to extend along the sides of the boat for at least two timber spaces and are to be through fastened by two bolts in each arm and one through the throat. The breasthooks are to be galvanized iron, or oak or hackmatack grown to form.

(i) **Rubbers, filling pieces, bilge keels.** Fore and aft rubbers shall be fitted to all boats. Clincher-built boats are to have filling pieces for about one-third of the boat's length amidships, fitted to the projecting plank edges from the gunwale to the bilge. In all boats intended to accommodate more than 60 persons, vertical fenders extending from the gunwale down to the bilge, are to be fitted to facilitate launching on the high side of a listed ship. These fenders are to be sufficient in number to prevent damage to the boats when being lowered. If the fenders are of wood they are to have cope iron fitted to the outside edges. Particulars of any proposed arrangements, including alternatives such as skates or rollers temporarily secured to the boat to prevent it from being damaged, and to facilitate launching, are to be submitted for the Commandant's approval. When bilge keels are fitted, they shall be secured to a doubling plank well fastened to the bottom planking and timbers by brass screws. Bilge-keel fastening shall not penetrate the bottom planking. Suitable hand grips shall be made in the bilge keels for use in event of capsizing.

(j) **Fastenings** Fastenings of the keel, stem and sternpost, aprons, knees, keelsons or deadwood shall be through fastenings wherever practicable, or long screws. There shall not be less than 6 through fastenings in the deadwood at each end of the boat. The hog shall be secured to the keel by galvanized screws 8 inches to 7 inches apart, and the keelson to the

keel by through fastenings 24 to 27 inches apart. In boats over 23 feet in length, the hog may be in two pieces provided it is scarphed to the satisfaction of the inspector. Box gunwales shall be through fastened at every timber, and solid gunwales should be secured with at least four through fastenings between each pair of thwart knees and strengthened by check pieces in way of rowlocks. All gunwales when not fitted in one length shall have either lipped or table scarphs, and the scarphs of gunwale shall be kept if possible beyond midship half length of the boat. Plank fastenings shall be copper of sufficient length and gage, and those in the plank edges, scarphs, and timbers properly clinched. One fastening is required between the timbers in each edge of each plank, subject to a maximum spacing of $3\frac{1}{2}$ inches in clincher-built boats.

94.19 Air tanks of lifeboats. All lifeboats constructed after June 30, 1905, shall be provided with air tanks, and in all lifeboats of 18 feet in length or over for lake, bay, or sound steamers contracted for after September 30, 1912, not more than 50 percent of the air-tank capacity shall be allowed in the ends of the boat, and the remaining capacity shall be located in the side tanks. *Provided, however,* That wooden lifeboats for use on steam pleasure vessels shall be exempt from the use of air tanks.

After June 20, 1912, the air tanks of all lifeboats shall be entirely independent of the hull or other construction and shall be of suitable noncorrosive material and of a capacity of not less than 15 cubic feet for each person allowed in metallic boats and not less than 1 cubic foot for each person allowed in wooden boats. *Provided,* That in all metallic boats constructed and inspected on and after March 1, 1931, there shall be at least 1 cubic foot for each person allowed in addition to sufficient air-tank capacity to float the boat (including its equipment), when filled with water. Such air tanks shall be firmly and securely fastened in the hull, and in such manner as will allow them to be temporarily removed, and in no case shall the tanks be punctured or opened for such fastenings. The tops of such tanks shall be thoroughly protected by a grating or platform or by the thwarts or seats. Such air tanks of 6 cubic feet or less shall be constructed of material of a thickness not less than No. 22 B W G, from 6 cubic feet to and including 15 cubic feet, of a thickness not less than No. 20 B W G, and all air tanks of more than 15 cubic feet capacity shall be of a thickness not less than No. 18 B W G.

All joints of air tanks shall be properly double riveted and tightly calked or securely hook jointed and efficiently soldered or properly and securely welded, and such air tanks shall be located in such a manner that will permit the lifeboat to be on as near an even keel as possible when flooded with water.

The cubic contents of air space of air tank shall be stamped on the tank where same can be seen when air tank is placed in boat.

All air tanks shall be fitted with a connection of one-half inch outside diameter for testing purposes.

Before any lifeboat is passed, and accepted, the air tanks thereof shall be tested in the presence of an inspector by an air pressure of not more than 1 pound to the square inch. At each subsequent annual inspection, or oftener if in the opinion of the inspectors it is necessary or desirable, the inspectors shall satisfy themselves that the tanks are in good condition, but pressure need not be applied unless the inspectors are in doubt regarding the efficiency of the tanks. This does not take from the inspectors the right and authority to satisfy themselves at any time, either by examination or pressure, as to the condition of the tanks.

94.20 Carrying capacity of lifeboats. The capacity of all lifeboats not otherwise provided for shall be determined by the following rule: Measure the length and breadth outside of the planking or plating and the depth inside at the place of minimum depths. The depth used in calculating shall not in any case exceed 45 percent of the breadth. The

product of these dimensions multiplied by 0.6 resulting in the nearest whole number shall be deemed the capacity in cubic feet

To determine the number of persons a boat is to carry, divide the result by 10 for lake, bay, and sound steamers

Example The carrying capacity of a boat 22 feet in length, 6 feet in breadth, and 2½ feet in depth shall be determined as follows

For lake, bay, and sound steamers,

$$\frac{22 \times 6 \times 2\frac{1}{2} \times 0.6}{10} = \frac{198}{10} = 19 \text{ persons}$$

Every lifeboat shall have sufficient room, freeboard, and stability to safely carry the number of persons allowed to be carried by the above rule, which fact shall be determined by actual test in the water at the time of the first inspection of the lifeboat, except that where a vessel is carrying lifeboats of different types or capacities, at least one lifeboat of each type or capacity shall be so tested

94 21 Numbering and marking of lifeboats (a) The number of each lifeboat shall be plainly marked or painted on each side of the bow in figures 3 inches high, and, where lifeboats are carried on both sides of a vessel, the odd-numbered boats shall be stowed on the starboard side and even-numbered boats on the port side, i. e., lifeboat No. 1 shall be forward on the starboard side, and lifeboat No. 3 next abaft lifeboat No. 1, lifeboat No. 2 shall be forward on the port side and lifeboat No. 4 next abaft lifeboat No. 2, etc. Where lifeboats are nested, the lifeboat under lifeboat No. 1 shall be numbered 1A, the lifeboat under lifeboat No. 2 shall be numbered 2A, etc.

(b) The cubical contents and number of persons allowed to be carried on each lifeboat shall be plainly marked or painted on each side of the bow in letters and numbers 1½ inches high. In addition, the number of persons allowed shall be plainly marked or painted on the top of at least two of the thwarts in letters and numbers 3 inches high. Such letters and numbers shall be dark on a light ground or light on a dark ground.

94 22 Lifeboats and life rafts kept clear for launching. The decks on which lifeboats of any class or life rafts are carried shall be kept clear of freight or any other obstruction that would interfere with the immediate launching of the lifeboats or life rafts.

94 23 Boat-davit falls and receptacles therefor. Blocks and falls installed after January 1, 1942, shall conform to the following requirements.

All blocks, falls, fairleads, padeyes, fastenings, etc., used in connection with lifeboat gear shall be designed with a minimum factor of safety of 6, based on the maximum working load.

Where mechanical means for lowering are required, not more than two-part falls shall be used, except in specific cases where three-part falls may be accepted.

Wire rope falls of 6 x 19 regular lay filler wire construction, prelubricated at the factory with suitable neutral wire rope lubricant, shall be accepted as standard. Any other type of wire superior or equally as good as the minimum standard specified may be used.

Falls shall be of such length that the lifeboat may be lowered to the water at the lightest seagoing draft with the vessel listed to 15°.

Falls shall be in readiness for use at all times. On vessels over 1,000 gross tons, not fitted with mechanical means for lowering, covered tubs, boxes, or reels shall be provided for the stowage of falls, and suitable lowering bits shall be fitted in easily accessible positions.

Where more than one lifeboat is served by the same set of davits, if the falls are of manila rope, separate falls shall be provided to serve each lifeboat.

Such blocks as are necessary to allow the falls to lead fair in all positions of the davit shall be fitted. Where mechanical means for lowering are provided, there shall be at least

8 feet between the center of the drum and the center of the nearest sheave. Sheaves for wire rope shall have a diameter at the base of the groove at least equal to 12 times the diameter of the rope.

There shall be ample clearance between the cheeks of blocks in which manila rope is used. The width between the cheeks shall be half an inch greater than the diameter of new ropes when those ropes are $3\frac{1}{4}$ inches in circumference or greater, blocks for smaller ropes shall be designed with clearance in the same proportion.

Means for lubrication shall be provided for all moving parts of blocks.

94.24 Care of lifeboats. Lifeboats shall be stripped, cleaned, thoroughly overhauled, and painted at least once in every year.

94.25 Tests of lifeboats at annual inspection. The inspectors shall satisfy themselves that every lifeboat, together with its equipment, of all vessels, is in every respect in good condition and ready for immediate use. Every lifeboat, with its required equipment, of passenger vessels, shall be lowered to near the water and loaded to its allowed capacity, evenly distributed throughout its length, and then lowered into the water afloat. In making this test, persons or deadweight may be used. If persons are used, the weight of each person shall average at least 140 pounds. When deadweight is used, the weight shall be equivalent to at least 140 pounds for each person allowed.

94.26 Handling of the boats and rafts. All the boats and rafts shall be stowed in such a way that they can be launched in the shortest possible time and that, even under unfavorable conditions of list and trim from the point of view of the handling of the boats and rafts, it may be possible to embark in them as large a number of persons as possible. The arrangements shall be such that it may be possible to launch on either side of the vessel as large a number of boats and rafts as possible. Where practicable, lifeboat chocks shall be so fitted that the lifeboats they serve shall not require lifting before launching. At least once in each interval of not longer than 3 months, the master of every inspected passenger vessel shall drill and exercise every member of the crew, except females, in pulling oars in the ship's lifeboats. In addition, the crew of the motor-propelled boats shall demonstrate their ability in the working of the engine and handling of the boat under power.

94.29 Inclosed lifeboats. All steamers carrying passengers shall be equipped with at least one lifeboat of approved open standard type. Where two lifeboats are required, one of the same may be of an approved inclosed type. Where three or more lifeboats are required, two of such lifeboats shall be of approved open standard type, one to be carried on each side under davits. In no case shall the lifeboat equipment of any steamer consist of more than 50 percent of approved lifeboats of inclosed type.

When the approved inclosed type of lifeboat is carried on steamers other than those carrying passengers, such steamers shall also be equipped with one lifeboat of approved open standard type of not less than 180 cubic feet capacity.

Where practicable, lifeboat chocks on passenger vessels shall be so fitted that the lifeboats they serve shall not require lifting before launching.

94.32 Life rafts: Drawings, specifications, name plate, and how marked. (a) All life rafts shall be substantially constructed in accordance with drawings, or blueprints, and specifications approved by the Commandant.

(b) Builders of life rafts shall furnish the Coast Guard District Commander of the district in which the life rafts are built drawings, or blueprints, and specifications showing and explaining the construction of same and showing the tensile strength and ductility of the metal used. Life rafts may be constructed of steel having a minimum tensile strength not less than 50,000 pounds per square inch and an elongation of at least 20 percent in a gage length of 8 inches; or of wrought iron having a minimum tensile strength of 45,000 pounds per square inch and a minimum elongation of 12 percent in 8 inches, or of other approved

metals Where steel is used and a minimum thickness of the metal is less than No 16 B W G, the elongation shall not be less than 15 percent in a gage length of 8 inches

(c) Builders of life rafts shall affix a plate or other device to each life raft, having thereon the builder's name, the manufacturer for whom approved, number of raft, date of construction of raft, cubical contents of raft, and number of persons said raft will carry, as determined by the rules of the Commandant

(d) There shall be stenciled in a conspicuous place on each life raft now in use the number of persons said raft can carry, as hereinafter provided

94 33 Inspection of life rafts when built. Coast Guard District Commanders of districts where life rafts are built shall detail an inspector to any place where life rafts are being built, whose duty it shall be to carefully inspect and examine the construction of such life rafts, and he shall satisfy himself that such life rafts are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders When the inspector approves the construction of the raft he shall stamp his initials, together with the letters U S C G, on a blank space on the plate required to be affixed to the raft by the builder The initials of the inspector shall be satisfactory evidence to all parties interested that the raft has been constructed in accordance with the drawings, or blueprints, and specification on file This section shall apply to all life rafts constructed after June 30, 1912

94 34 Construction of rafts of the catamaran type All metal life raft cylinders of more than 15 feet in length or of more than 16 inches in diameter shall be constructed of metal not less than No 18 B W G No life raft cylinders shall be of less thickness of metal than No 20 B W G

The retaining bands which secure the cylinders to the frames shall be made in halves, so that the cylinders may be detached without difficulty and without disassembling the body of the raft, for the purpose of inspection, cleaning, and painting, as required by § 94 37 of this chapter Wooden guards and gunwales shall be secured to the retaining bands by angle-iron clips or by the jaws of the retaining bands Iron rods extending across the raft at top and bottom shall pass through the gunwale and its securing clips or jaws at each end of the raft The ends of the rods shall be properly secured with a screw nut inside and outside of the gunwale

All such cylinders shall be divided by watertight bulkheads into not less than three compartments of equal lengths Cylinders over 9 feet in length shall be divided into equal lengths by watertight bulkheads into not less than one compartment for every 3 feet of its length One of such bulkheads shall be at the extreme end of each cylinder or as near thereto as the flange of cone or bumped ends will permit Each compartment shall be provided with a suitable air-pump connection of one-half inch outside diameter, fitted with airtight cap

Only countersunk-headed rivets shall be used in the construction of metallic life rafts

All seams and joints shall be properly double riveted, or where welding is employed the welders shall be qualified by the Coast Guard

The above provisions of this section shall take effect only as to life rafts constructed after December 31, 1908

The circumferential as well as the longitudinal seams of life raft cylinders shall be riveted and tightly calked, or securely hook-jointed and efficiently soldered, or properly and securely welded on rafts constructed after June 30, 1905 Such longitudinal seams shall be secured by not less than 12 rivets to each foot, circumferential seams by not less than 10 rivets to each foot, and bulkheads by not less than 8 rivets to each foot Bulkhead flanges may be single riveted The diameter of shank of rivets shall be not less than No 10 B W. G

The framework connecting the cylinders of metallic life rafts shall be substantially built and capable of resisting the strain which tends to break the cylinders apart when the raft is broadside on in surf or seaway

94 35 Capacity and allowance of catamaran life rafts. No type of raft may be approved unless it satisfies the following conditions

- (a) It should be reversible
- (b) It should be of such size, strength, and weight that it can be handled without mechanical appliances, and, if necessary, be thrown from the vessel's deck
- (c) It shall have not less than 3 cubic feet of air cases or equivalent buoyancy and not less than 3 square feet of deck surface for each person allowed. Rafts already in use may have the rating changed by the Coast Guard District Commander of the district where the same are being used to meet these requirements and allowances
- (d) The air tanks or equivalent buoyancy should be placed as near as possible to the sides of the raft

At least one-half of the number of life rafts on all steam vessels shall have a capacity exceeding 15 persons

Tule and all other types of catamaran life rafts shall meet the requirements herein specified

94 36 Tests of air tanks of life rafts Before any life raft is passed and accepted, the air tanks thereof shall be tested in the presence of an inspector by an air pressure of not more than 1 pound to the square inch. At each subsequent annual inspection, or oftener, if in the opinion of the inspectors it is necessary or desirable, the inspectors shall satisfy themselves that the tanks are in good condition, but pressure need not be applied unless the inspectors are in doubt regarding the efficiency of the tanks. This does not take from the inspectors the right and authority to satisfy themselves at any time, either by examination or pressure, as to the condition of the tanks

94 37 Care of life rafts All life rafts shall be stripped, cleaned, painted, and thoroughly overhauled at least once in every year, and inspectors shall carefully examine at all inspections the material which supports the platform of all life floats in order to determine to their satisfaction that the strength is maintained. If it is found that deterioration has begun it shall be corrected even to the extent of requiring the renewal of the platform-supporting device

94.38 Approved life rafts. Any type of life rafts approved by the Commandant shall be considered as equivalent to the standard raft above specified

94 48 Equipment for life rafts All life rafts shall be equipped as follows

(a) **Boathook.** One boathook of clear-grained wood of suitable length but not less than 6 feet by 1½ inches in diameter

(b) **Life line.** A life line properly secured entirely around the sides and ends of the life raft, festooned in bights not longer than 3 feet, with a seine float in each bight. The life line shall be of a size and strength not less than 12-thread manila rope

(c) **Oars or paddles** Four oars and one steering oar for all life rafts for seven persons and over. The oars shall be of suitable size but not less than 8 feet in length. Two paddles for all life rafts for six persons or less. The paddles shall be of suitable size but not less than 5 feet in length

(d) **Painter.** One painter of manila rope not less than 2¾ inches in circumference and of a length not less than three times the distance between the boat deck and the light draft.

(e) **Rowlocks.** On life rafts for seven persons and over, five rowlocks attached by separate chains in such a manner that they may be used from either side of the raft. A becket may be substituted for the steering oar rowlock

(f) **Stowage of equipment** The boathook and oars or paddles shall be securely lashed on the sides of the life raft to which they belong.

94 49 Equipment for life floats. All life floats shall be equipped as follows

(a) **Boathook.** One boathook of clear-grained wood of suitable length but not less than 6 feet long by 1½ inches in diameter

(b) **Life line** A life line properly secured entirely around the sides and ends of the float, festooned in bights not longer than 3 feet, with a seine float in each bight. The life line shall be of a size and strength not less than 12-thread manila rope

(c) **Paddles** Four paddles

(d) **Painter** One painter of manila rope not less than 2¾ inches in circumference, and of a length not less than three times the distance between the boat deck and the light draft

(e) **Stowage of equipment.** The boathook and paddles shall be securely lashed on the sides of the life float to which they belong

94.50 Certificated lifeboatmen, manning of the boats There shall be for each boat or life raft a number of lifeboatmen at least equal to that specified in the following table

If the prescribed complement is—	The minimum number of certificated lifeboatmen shall be—
Less than 26 persons.....	1
From 26 to 40 persons.....	2
From 41 to 61 persons.....	3
From 62 to 85 persons.....	4
Above 85 persons.....	5

The allocation of the certificated lifeboatmen to each boat and raft remains within the discretion of the master, according to the circumstances

By "certificated lifeboatmen" is meant any member of the crew who holds a certificate of efficiency issued under the authority of the Commandant

In order to obtain the special lifeboatman's certificate the applicant shall prove to the satisfaction of an officer designated by the Commandant that he has been trained in all the operations connected with launching lifeboats and the use of oars, that he is acquainted with the practical handling of the boats themselves, and, further, that he is capable of understanding and answering the orders relative to lifeboat service

94.51 Manning of the boats A licensed officer or able seaman shall be placed in charge of each boat or pontoon raft, he shall have a list of its lifeboatmen, and other members of its crew which shall be sufficient for her safe management, and shall see that the men placed under his orders are acquainted with their several duties and stations. *Provided*, That if the raft carries 15 persons or less a licensed officer or able seaman need not be placed in charge of such raft. *Provided, further*, That one-half the number of rafts carried shall have a capacity of exceeding 15 persons

A man capable of working the motor shall be assigned to each motorboat,

The duty of seeing that the boats, pontoon rafts, and other lifesaving appliances are at all times ready for use shall be assigned to one or more officers

94.52 Life preservers—(a) Number required. All vessels shall be provided with one approved life preserver for each person carried. Passenger vessels shall be provided with an additional number suitable for children equal to at least 10 percent of the total number of persons carried

(b) **Distribution, stowage, and notices** (1) Life preservers, including those especially provided for children, shall be properly distributed throughout the staterooms, berthings, and other places convenient for passengers and crew

(2) Lockers, boxes, and closets in which life preservers are stowed shall be plainly marked, and the life preservers contained therein shall be readily available

(3) Life preservers stowed overhead shall be so supported that they can be quickly released and distributed among passengers. Where life preservers are stowed overhead at a height greater than 7 feet from the deck below, efficient means shall be provided for their immediate release and distribution, to be operated by persons standing on the deck

(4) A printed notice shall be posted in every cabin and stateroom and in conspicuous places about the deck, informing passengers of the location of the life preservers and describing and illustrating the method of applying or adjusting them

(c) **Shipboard inspections** At each annual inspection of any vessel, or oftener if deemed necessary, the life preservers shall be examined by an inspector to determine serviceability. When life preservers are found to be in accordance with the requirements, the inspector shall stamp them with the word "Passed", his initials, port, and date. Life preservers found not to be in a serviceable condition shall be removed from the vessel's equipment and, if beyond repair, shall be destroyed in the presence of the inspector.

Note.—The specifications for life preservers are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the manufacture of life preservers, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows:

160 001 Life Preservers, General (46 CFR subpart 160 001)
 160 002 Life Preservers, Kapok, Adult and Child (Jacket Type), Models 2, 3, 5 and 6 (46 CFR subpart 160 002)
 160 003 Life Preservers, Cork (Jacket Type), Models 31 and 35 (46 CFR subpart 160 003)
 160 004 Life Preservers, Balsa Wood (Jacket Type), Models 41 and 45 (46 CFR subpart 160 004)
 160 006 Life Preservers, Repairing, Re-covering and Cleaning (46 CFR subpart 160 006)
 164 001 Cork Sheet (46 CFR subpart 164 001)
 164 002 Balsa Wood (46 CFR subpart 164 002)
 164 003 Kapok Processed (46 CFR subpart 164 003)

94 53 Life buoys—(a) Number required (1) The minimum number of approved 30-inch life buoys and the minimum number to which approved water lights shall be attached shall be in accordance with the following table:

Length of vessel	Minimum number of approved 30-inch life buoys	Minimum number of approved 30-inch life buoys with approved water lights attached
Under 100 feet	2	0
100 feet and under 200 feet	4	2
200 feet and under 300 feet	6	2
300 feet and under 400 feet	12	4
400 feet and under 600 feet	18	6
600 feet and under 800 feet	24	12
800 feet and over	30	15

(2) One life buoy on each side of a vessel shall have an attached line at least 15 fathoms in length.

(b) **Distribution and securing of life buoys and water lights** All life buoys and water lights shall be distributed and secured as follows:

(1) All life buoys shall be so placed as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to the persons concerned.

(2) The life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way.

Note.—The specifications for life buoys are in Subchapter Q—Specifications in Chapter I of Title 46, Code of Federal Regulations, and have not been reprinted herein. As these specifications cover the manufacture of ring buoys, copies may be obtained upon request from the Commandant (MMT), U S Coast Guard, Washington 25, D C, and are identified as follows:

160 009 Buoys, Life, Ring, Cork and Balsa Wood (46 CFR Subpart 160 009)
 164 001 Cork, Sheet (46 CFR Subpart 164 001)
 164 002 Balsa Wood (46 CFR Subpart 164 002).

94 54 Self-igniting water lights. The self-igniting water lights for ring buoys and life rafts shall consist of a cylinder (with bumped heads or ends) made of good sheet copper of not less than 0.022 inch thick, and shall be so designed as to be nonexplosive, and shall be

free from any defects which may affect the serviceability or operation of the light. The cylinder shall be sufficiently weighted in the bottom to recover and maintain an upright position in the water, and all circumferential and horizontal seams of the cylinder shall be hook-jointed and soldered, and the top circumferential seam shall be flush, so as to prevent the lodgment of water.

The cylinder shall be provided with a plug or other device of such character that when removed from the cylinder sufficient water will be admitted to insure the prompt and efficient action of the light, regardless of whether the cylinder when first striking the water becomes completely submerged.

The removal of the plug or device shall be effected by the operation of a lanyard attached to the buoy and to the plug or device on the cylinder, and shall be so arranged and constructed that the weight of the buoy when thrown overboard will automatically disengage the plug or device, and will insure that the light will self-ignite within one minute after reaching the surface of the water.

The cylinder shall contain calcium carbide (taken from fresh stock entirely free from the white powdery substance resulting from exposure to the air) and calcium phosphide sufficient to create a brilliant flame of at least 150 candlepower, which shall be maintained and burn for a continuous period of not less than 45 minutes without emitting obnoxious fumes. If at any time during this period the flame is extinguished, due to the total submersion of the light, the light shall self-ignite upon coming to the surface.

The self-igniting water lights required for life rafts shall meet the requirements of this section except that the plug or device may be removed by manual action instead of by automatic action of the buoy lanyard above referred to.

The cylinder shall be plainly marked with the word "Top" at its top end and permanently indented or embossed with the name and address of the manufacturer, the year of manufacture (the use of labels of any description for this purpose is strictly forbidden), and with the statement that the device meets in every way the requirements of the Commandant.

On and after July 1, 1924, no type or make of water light will be approved which has not been tested by the Bureau of Standards, Department of Commerce, and found to conform in all respects to the requirements in this part.

94 55 Steering apparatus (a) Extra steering apparatus consisting of relieving tackle, or of auxiliary power or hand steering gear attached to the rudder stock independent of the regular steering gear shall be provided.

(b) Where reasonable and practicable, the emergency steering wheel shall be located on the after weather deck, and an efficient means of communication shall be provided between the pilothouse, the emergency steering station, and the steering engine room.

(c) The following requirements relative to the arrangement of steering stations are applicable to new installations and replacements of existing installations on all classes of vessels.

(1) Steering wheels in or at steering stations shall be installed in a vertical position and arranged for steering by the helmsman when standing abaft the wheel and facing forward. The top of the steering wheel, the rudder blades, and the head of the ship shall move in the same direction.

(2) When a "trick" wheel is installed in the steering gear room and is used for warming up and testing the gear, and also for steering purposes, this wheel shall be arranged as follows:

(i) If the "trick" wheel is installed in a vertical position it shall meet all requirements outlined in subparagraph 1.

(ii) If the "trick" wheel is installed in a horizontal position it shall turn in a clockwise direction for "right rudder" and in a counterclockwise direction for "left rudder." With this arrangement, the helmsman need not stand abaft the wheel.

(3) Where "trick" wheel or other device is installed in the steering gear room for the sole purpose of warming up and testing the gear, it may be installed to best suit design and operating conditions of the gear. A plate shall be fitted on this wheel or device with indicating arrows showing the direction of movement to produce "right rudder" and "left rudder."

(4) When auxiliary steering gear is installed in lieu of relieving tackles, the steering wheel or device used for operating the gear shall meet all requirements outlined in paragraph (c) (1) of this section.

(5) At all steering stations, there shall be installed a suitable notice on the wheel or device, or in such other position as to be directly in the helmsman's line of vision, to indicate the direction in which the wheel or device must be turned for "right rudder" and for "left rudder."

(d) Where no regular rudder is fitted and steering action is obtained by a change of setting of the propeller unit, the requirements of paragraphs (a), (b) and (c) of this section will not generally be applicable, and special consideration will be given.

94.55a Embarkation aids—(a) Ladders. Vessels carrying passengers shall be provided with suitable ladders to enable passengers to descend in lifeboats and life rafts, one such ladder being provided for each set of boat davits. These ladders shall be kept ready and convenient for use on the lifeboat deck, and shall reach from such deck to the vessel's light water line. They shall be reversible and free from garment-entangling projections.

(b) Illumination for boat-launching operations. (1) Provision shall be made on all passenger vessels, where the boat deck is more than 30 feet above the water line at the lightest seagoing draft, for readily and continuously available illumination from the vessel of lifeboats when alongside and in process of or immediately after being launched. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system and placed in the upper part of the vessel above the bulkhead deck.

(2) The emergency generating set will ordinarily provide a satisfactory source of illumination, and, where used for this purpose, it shall be of sufficient power to provide for such illumination in addition to other demands made upon the set.

94.56 Bulkheads. Every mechanically propelled vessel of more than 75 gross tons carrying passengers for hire shall have a sufficient number of iron or steel transverse watertight bulkheads so that the vessel will remain afloat and have positive stability in the event any one main compartment is flooded.

A forepeak or collision bulkhead shall be fitted and located not less than 5 percent of the length of the ship, and not more than 10 feet plus 5 percent of the length of the ship from the bow, at load water line.

One bulkhead shall be fitted at the forward end of the machinery space (which includes boiler space) and one bulkhead shall be fitted at the aft end of the machinery space. Other transverse bulkheads shall be so located as to meet the above requirements of subdivision and stability.

Main transverse bulkheads shall not be stepped, but may be recessed. No recess shall be fitted nearer the vessel's side than one-fifth of the vessel's beam amidships measured at right angles to the center line at the level of the load water line on which the subdivision is based. Bulkheads shall extend to a deck whose distance above the load water line is sufficient to enable the subdivision and stability requirements to be met with a fair margin of safety.

If the distance between two adjacent main transverse watertight bulkheads is less than 10 feet plus 2 percent of the vessel's length measured between perpendiculars at the extremities of the vessel's load water line, only one of these bulkheads shall be regarded as forming a boundary of a main compartment.

94 57 Means of escape from steamers. On all steamers where the plans and arrangements will possibly permit, all inclosures where passengers or crews may be quartered, or where anyone may be employed, shall be provided with not less than two avenues of escape, so located that if one of such avenues is not available another may be

Every steam vessel shall be provided with sufficient means of escape from the lower to the upper deck, or vice versa, and every steamer of 50 tons or over carrying passengers shall be provided with permanent stairways forward and aft, except where said stairways on towing boats would interfere with towing bitts

Airports 16 inches or more in diameter in the hull of all passenger vessels that open into the passageways shall have a life line securely fastened overhead within the passageway. This life line shall be not less than 2 inches in circumference, knotted every 3 feet, and of sufficient length to reach the water at the lightest seagoing draft

94 58 Vessel's name on equipment All the equipments of a vessel, such as buckets, hose, axes, boats, oars, rafts, life preservers, floats, barrels, and tanks, shall be painted or branded with the name of the vessel upon which they are used.

94 59 Disengaging apparatus Lifeboats shall be fitted with suitable disengaging apparatus. Mechanical disengaging apparatus shall be of a type approved by the Commandant. Excluding the emergency boats, not more than one type of releasing gear shall be fitted in the lifeboats of a particular vessel

PART 95—FIRE APPARATUS, FIRE PREVENTION

Sec		Sec.	
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95 4	Steam and inert-gas fire-extinguishing systems	95 21	Fire extinguishers for emergency power plants
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CROSS REFERENCE

Definition of terms See § 94 01

Section 95.01 Basis and purpose of regulations By virtue of the authority vested in the Commandant of the Coast Guard under section 101 of the Reorganization Plan No 3 of 1946 (11 F R 7875), R S 4405, 4426, 4470, 4471, 4477, and 4479, as amended, Act of June 20, 1936, section 2 of Act of October 9, 1940, and section 5 (e) of Act of June 6, 1941 (48 U S C 367, 375, 404, 463, 463a, 464, 471, 472, 50 U S C 1275), the regulations in this part are prescribed to provide adequate means for detecting, preventing, or fighting of fires on board vessels subject to these regulations in accordance with the intent of the various statutes on fire apparatus or fire prevention and to obtain their correct and uniform administration

95 1 Fire axes All steamers navigating lakes, bays, and sounds are required to be provided with axes, as follows

Gross tons	Axes
All steamers not over 10 tons-----	1
All steamers over 10 tons and not over 50 tons-----	1
All steamers over 50 tons and not over 200 tons-----	2
All steamers over 200 tons and not over 500 tons-----	4
All steamers over 500 tons and not over 1,000 tons-----	6
All steamers over 1,000 tons-----	8

95 2 Location of axes All axes shall be located so as to be readily found in time of need, shall not be used for general purposes, and shall be kept in good condition

95 3 Glass lamps The use of glass lamps shall be prohibited on any vessel under the jurisdiction of the Coast Guard unless the same are securely fitted into suitable metal brackets

95 4 Steam and inert-gas fire-extinguishing systems—(a) General requirements (1) All mechanically propelled vessels carrying combustible cargo in the holds, 'tween-decks, or other closed cargo compartments except those engaged exclusively in the carriage of coal

in bulk, shall be equipped with means for extinguishing fire in such compartments by the use of a steam fire-extinguishing system or by the use of any inert-gas fire-extinguishing system approved by the Commandant

(2) Cabinets, boxes, or casings inclosing manifolds or valves shall be distinctly marked in painted letters, about 3 inches in height, "Steam Fire Apparatus" or "CO₂ Fire Apparatus," as the case may be

(3) Steam or gas piping fitted for extinguishing fire shall not be used for any other purpose except that it may be used for fire-detecting purposes

(4) Pipes for conveying steam from the boilers for the purpose of extinguishing fire shall not be led into the cabins, other passengers' or crew's quarters, or working spaces. Pipes for conveying carbon dioxide or other extinguishing vapors for the purpose of extinguishing fire shall not be led into the cabins or other passengers' or crew's quarters

(5) Steam smothering lines shall be tested with at least 50 pounds air pressure with ends of the smothering lines capped, or by blowing steam through the lines, and a survey made for detecting corrosion and defects, using the hammer test or such other means as may be necessary

(6) At annual inspections, all carbon dioxide (CO₂) cylinders, whether fixed or portable, shall be examined externally and replaced if excessive corrosion is found, and all cylinders shall also be checked by weighing to determine contents and if found to be more than 10 percent under required contents of carbon dioxide, the same shall be recharged

(b) **Steam systems on mechanically propelled vessels contracted for prior to July 1, 1935** (1) The main pipes and their branches, on mechanically propelled vessels carrying passengers or freight, to convey steam from the boilers to the hold and separate compartments of the same shall be not less than 1½ inches in diameter. Steam pipes of not less than three-fourths of an inch in diameter shall be led into all lamp lockers, oil rooms, and like compartments, which lamp lockers, oil rooms, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal

(2) All branch pipes leading into the several compartments of the hold of the vessel shall be supplied with valves, the handles distinctly marked to indicate the compartment or parts of the vessel to which they lead. These valves or their handles shall be placed in not more than two places on the most suitable and accessible deck of the vessel and so arranged that all can be inclosed in cabinets, boxes, or casings

(c) **Steam systems on mechanically propelled vessels contracted for on or after July 1, 1935** (1) Steam for fire-extinguishing systems shall be available from the main boilers or from a donkey or auxiliary boiler having a minimum capacity equivalent to 1 square foot of heating surface for each 300 cubic feet of the largest compartment in which cargo is carried. This requirement shall be based upon a rate of evaporation of 6 pounds of steam per hour per square foot of heating surface from and at 212° F medium steaming. Equivalent values of heating surface will be permitted for boilers having rates of evaporation differing from that herein specified

(2) The minimum boiler capacity shall be based upon the volume of the largest compartment in cubic feet, which shall be determined by measurements taken between fire-retarding boundaries such as decks having hatch covers with proper battening down arrangements, shells, tank tops, watertight and fire-retarding bulkheads

(3) A steam pressure of at least 100 pounds per square inch shall be maintained for fire-extinguishing purposes. Where the maximum allowable boiler working pressure will not permit of this, the maximum steam pressure permitted by the operating boiler pressure limitations shall be provided for this purpose

(4) The pipe lines shall be led from not more than three stations in easily accessible locations on the weather deck to each cargo hold, cargo 'tween-decks, or other closed cargo compartments, and to each cargo-oil deep tank, lamp locker, oil room, and like compartments,

which lamp locker, oil room, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal. The steam connections to the lamp lockers, oil rooms, and like compartments may be taken from the nearest steam supply line, independent of the extinguishing manifolds. In lamp lockers, oil rooms, and like compartments, adequate means may be provided for ventilation if suitable dampers capable of being operated from outside the spaces are fitted in each vent duct.

(5) Each pipe in the extinguishing manifolds shall be fitted with a shut-off valve plainly and permanently marked to indicate into which compartment it discharges. This requirement also applies to independent extinguishing lines.

(6) Manifold steam supply pipes shall be fitted with master valves at the manifolds, and provision shall be made for draining the manifold and individual lines to protect them against freezing. If the manifolds are located on an open deck, they shall be inclosed in a metal box.

(7) The minimum diameter of any steam fire-extinguishing pipe to a cargo hold, cargo 'tween-decks, other closed cargo compartments, or cargo-oil deep tank shall be 1 inch, the size and number of pipes to be governed by the size of the compartment. The minimum diameter of any steam fire-extinguishing pipe to a lamp locker, oil room, or like compartments, shall be three-fourths of an inch.

(8) The required diameter of pipe to cargo compartments may be determined by the formula

$$D = \sqrt{\frac{C}{30,000}}$$

where

D = required diameter of pipe, in inches

C = volume of compartment, in cubic feet

or by the following table

Volume of compartment	Number of branches to compartment	Size of branches	Volume of compartment	Number of branches to compartment	Size of branches
30,000.....	1	<i>Inches</i> 1	94,000.....	2	<i>Inches</i> 1½
46,000.....	1	1¼	135,000.....	2	1½
67,000.....	1	1½	203,000.....	3	1½

(9) The diameter of the main supply line to the manifolds shall be computed by the following formula

$$D = \sqrt{\frac{C}{60,000}}$$

where

D = diameter of pipe required, in inches

C = volume of all compartments, in cubic feet

(d) **Inert-gas systems on mechanically propelled vessels.** (1) When a carbon dioxide (CO_2) smothering system is fitted in the cargo hold, cargo 'tween-decks, or other closed cargo compartments, or cargo-oil deep tanks, the quantity of carbon dioxide shall be sufficient to give a gas saturation of 30 percent of the gross volume of the largest cargo hold. The quantity in pounds of carbon dioxide required may be determined approximately by the following formula

$$W = \frac{L \times B \times D}{30}$$

Where

W = the weight of CO_2 required, in pounds

L = the length of the hold, in feet

B = the mean breadth of the hold, in feet

D = the depth from tank top or flat forming lower boundary to top of uppermost space in which freight may be carried, in feet

(2) When a carbon dioxide (CO_2) smothering system is fitted in the lamp locker, oil room, or like compartments, the quantity in pounds of carbon dioxide required may be determined by dividing the gross volume of the space by a factor of 22. Lamp lockers, oil rooms, and like compartments, in all classes of vessels, shall be wholly and tightly lined with metal. The whole charge of gas shall be capable of being released simultaneously by operating one valve and control, and all cylinders shall be completely discharged in not more than 2 minutes.

(3) Pipes used for supplying carbon dioxide to the cargo holds, cargo 'tween-decks, other closed cargo compartments, and cargo-oil deep tanks shall be not less than three-fourths inch inside diameter. Pipes used for supplying carbon dioxide to lamp lockers, oil rooms, and like compartments shall not be less than one-half inch inside diameter.

(4) The control(s) releasing the inert gas shall be located in a position(s) outside the space(s) protected and shall be readily accessible when the vessel is being navigated. All valves shall be permanently marked to indicate into which compartment they discharge.

(5) Provisions shall be made to prevent the admission of air into the lower parts of cargo holds, cargo 'tween-decks, and other closed cargo compartments while the inert-gas system is in operation.

(6) Cylinders, piping, and controls for the inert-gas system shall be protected from damage and shall be securely fastened and supported.

95 5 Steam fire pumps or their equivalent—(a) Fire pumps on steam vessels contracted for prior to July 1, 1935. (1) Steam vessels required to be provided with double-acting steam fire pumps or other equivalents for throwing water shall be equipped with such pumps according to their tonnage, as follows: Steam vessels over 20 gross tons and not exceeding 150 gross tons shall have not less than 50 cubic inches pump-cylinder capacity. Steam vessels of over 150 gross tons and under 3,000 gross tons shall have not less than one-third of 1 cubic inch pump-cylinder capacity for every gross ton. Steam vessels of 3,000 gross tons and over shall have pump-cylinder capacity of not less than 1,000 cubic inches. This rule shall apply only to pumps installed after June 30, 1907, and all pumps now approved and in use or installed before said date shall be accepted if complying with requirements of law and regulations in force at the time of their installation.

(2) On steam vessels required by paragraph (a) (1) above to have steam fire pumps or their equivalents, the fire mains shall be led from the pumps to all decks, with sufficient number of outlets arranged so that any part of the steam vessel can be reached with water with the full capacity of the pumps and by means of a single 50-foot length of hose from at least one of said outlets. On all classes of steam vessels every such pump shall be fitted with a gage and a relief valve of such size as to restrict the pressure of water to 100 pounds per square inch.

(b) Fire pumps on steam vessels contracted for on or after July 1, 1935. (1) Passenger vessels of 100 gross tons and under shall be equipped with one hand fire pump with a pump-cylinder capacity not less than 100 cubic inches, or a power-driven pump of equivalent discharge capacity.

(2) Vessels exceeding 100 gross tons shall be equipped with fire pumps and fire piping as follows:

(i) All vessels shall be provided with powerful pumps available for use as fire pumps. Passenger vessels of less than 4,000 gross tons shall have two, and larger passenger vessels

at least three, independently driven pumps connected to the fire main. Cargo vessels and towing vessels of less than 1,000 gross tons shall have one, and larger cargo or towing vessels at least two, such pumps so arranged. Each pump shall be capable of delivering two powerful jets of water simultaneously from the highest outlets on the fire main at a Pitot tube pressure of approximately 50 pounds per square inch through nozzles, each having an orifice of not less than seven-eighths-inch diameter where the internal diameter of the hose exceeds 1½ inches and not less than five-eighths inch in diameter where the internal diameter of the hose does not exceed 1½ inches.

(u) On oil-burning passenger vessels, where two or more pumps are required, they shall not all be located in the same compartment. Where the engine and firerooms are not entirely separated by steel bulkheads, or if fuel oil can drain from the fireroom bilges into the engine room, one of the fire pumps shall be located in an accessible space in a separate compartment.

(w) On oil-burning cargo vessels, where two pumps are required, they may be located in the same compartment provided the compartment is equipped with an approved fixed carbon dioxide extinguishing system.

(3) Outlets from the fire mains shall be of a sufficient number and so arranged that any part of the living quarters, weather decks, and any parts of cargo decks accessible to crew or passengers, while the vessel is being navigated, may be reached with a single 50-foot length of hose. Outlets within accommodations and service spaces adjacent thereto shall comply with the above or they may be so arranged that any part may be reached with a single 75-foot length of hose, provided a siamese connection is fitted at each outlet. Where the fire main is located on an exposed deck, branches shall be provided so that the hose connections necessary to comply with the foregoing be distributed on both sides of the vessel. The fire hose shall be connected to the outlet at all times, except on open decks where the location of the fire hydrants is such that no protection is afforded for the hose in heavy weather. The fire hose may be temporarily removed from the hydrant when it will interfere with the handling of cargo.

(4) Outlet openings shall have a diameter of not less than 1½" and shall be fitted with suitable hose connections and spanners. The arrangement of the fire hydrant shall be limited to any position from the horizontal to the vertical pointing downward, so that the hose will lead downward or horizontally, in order to minimize the possibility of kinking. In no case will a hydrant arranged in a vertical position with the outlet pointing upward be accepted.

(5) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 pounds higher than the pressure necessary to maintain the requirements of paragraph (b) (2) (i) above, and a pressure gage to indicate the pressure on the fire main. If the fire pumps operating under shutoff conditions are not capable of producing a pressure exceeding 125 pounds per square inch, the relief valve may be omitted.

(6) Fire hose shall not be used for any other purpose than fire extinguishing.

95 6 Dimensions of fire pumps; spanners. Steamers are not restricted to any particular proportions for fire pumps. Any dimensions that will attain the requirements specified in § 95 5, or greater in capacity, may be allowed. *Provided, however,* That all hydrant connections be supplied with suitable spanners.

95 7 Capacity of pipes and hose. The capacity of the pipes and hose leading from the pumps shall in no case be less than that of the discharge opening of the pump. *Provided, however,* That the pipes and hose shall in no instance be less than 1½ inches in internal diameter.

And provided further, That steamers of 15 tons and under may be allowed to use hose of three-fourths of an inch internal diameter, but in no case shall it be less than the discharge opening of the pumps.

95 8 Rotary pumps. A rotary pump, when driven by an engine independent of the main engine, may be considered as an equivalent for the double-acting fire pump and used as such when equal to it in efficiency and capacity

95 9 Boiler-testing pumps Any steamer having on board an independent steam pump and an auxiliary boiler suitably arranged and of sufficient strength and capacity for testing the boilers thereof, or if one of the hand fire pumps be suitably arranged and of sufficient strength and capacity for testing the boilers, or if the "doctor," so called, when arranged permanently for testing the boilers, is, in the judgment of the inspectors, suitable for the purposes intended, may be considered as having complied with the law requiring a pump for testing boilers.

95.10 "Doctor " Any steamer of 50 gross tons or under, required to have a double-acting steam fire pump, and having in use on board a "doctor," so called, may be considered as having a lawful equivalent for such a pump when such "doctor" has pipes attached to it leading to the upper and between decks, such pipes being provided with hose and valves, according to law, but the pipes and hose shall in no case be less than 1½ inches in internal diameter. The pumps for supplying the boilers shall in no case be considered as an equivalent for the double-acting steam fire pump, on steamers above 50 gross tons

95 11 Connecting, bilge, and sounding pipes, hose tests All steam fire pumps required shall be supplied with connecting pipes leading to the hold of the vessel with stopcocks or shut-off valves attached and so arranged that such pumps may be used for pumping and discharging water overboard from the hold

Each and every steam vessel shall be fitted with a bilge pipe leading from each compartment of the vessel and connecting with a suitably marked valve to the main bilge pump in the engine room, and each compartment of all steam vessels shall be fitted with suitable sounding pipe, the opening of which shall be accessible at all times, except that in compartments accessible at all times for examination no sounding tubes are necessary

Steam siphons may be substituted in each compartment for the bilge pipes

All hose required on steam vessels for fire purposes shall be tested to a pressure of 100 pounds to the square inch at each inspection, and it shall be the duty of the Officer in Charge, Marine Inspection, at each annual inspection to see that the couplings are securely fastened to the hose by suitable external or internal clamps, and at least one length of such hose shall be kept at all times attached to each outlet of the fire main and provided with a suitable nozzle. *Provided*, That on freight steamers where the keeping of such hose coupled on interferes with the loading or unloading of cargo they may be removed during such loading or unloading

95.12 Fire mains and hose connections. All pipes used as mains for conducting water from fire pumps on steam vessels in place of hose shall be of steel, wrought iron, brass, or copper with wrought iron, brass, or composition hose connections

95 12a Pumps on motor vessels Motor vessels of fifty gross tons and over carrying passengers for hire shall be equipped with pumps for throwing water according to the tonnage as described in § 61 5 for steam vessels and equipped as prescribed in §§ 61 5 to 61 7, inclusive, as they now exist or may hereafter be amended

95.13 Portable fire extinguishers. All vessels carrying passengers, including pleasure vessels, shall be provided with such number of good and efficient portable fire extinguishers, approved by the Commandant as is hereafter prescribed, viz

Vessels less than 150 feet in length shall have at least two fire extinguishers on each passenger deck, vessels 150 feet and over in length shall be provided with at least one fire extinguisher for every 150 linear feet of corridor length or fraction thereof, in the spaces

occupied by passengers and crew In all public spaces extinguishers shall be located not more than 150 feet apart

Freight and towing vessels shall be provided with chemical fire extinguishers as hereafter described, viz

	<i>Minimum number of fire extinguishers</i>
Vessels of over 15 and not over 50 gross tons.....	1
Vessels of over 50 and not over 100 gross tons.....	2
Vessels of over 100 and not over 500 gross tons.....	3
Vessels of over 500 and not over 1,000 gross tons.....	6
Vessels of over 1,000 gross tons.....	8

The above tables of required fire extinguishers are based on the capacity of the ordinary machine, which is about 2½ gallons, and no fire extinguisher of larger capacity shall be allowed a greater rating than that of the ordinary machine Fire extinguishers of approved types of less capacity are allowable under the above tables when their total contents equal the required quantity

All vessels carrying passengers, which transport automobiles or motor vehicles, the motive power of which is generated by any of the products of petroleum or other inflammable liquids shall carry, in addition to the chemical fire extinguishers required by the preceding table for vessels carrying passengers, an approved carbon dioxide, foam type or carbon tetrachloride fire extinguisher which has demonstrated a capacity for extinguishing burning oils, burning gasoline, and other burning products of petroleum, in accordance with the following table

Automobiles or motor vehicles carried	Carbon dioxide or foam-type fire extin- guishers	Carbon tetra- chloride fire extin- guishers	Automobiles or motor vehicles carried	Carbon dioxide or foam-type fire extin- guishers	Carbon tetra- chloride fire extin- guishers
1 and not over 5.....	1	4	21 and not over 30....	4	8
6 and not over 10.....	2	5	31 and not over 40....	5	10
11 and not over 20....	3	6	41 and not over 50....	6	12

For each additional 20 automobiles or motor vehicles, or fraction thereof, add one carbon dioxide or one foam or two carbon tetrachloride fire extinguishers

The requirements may be reduced to 25 percent, but not less than one of either, when an efficient overhead water-sprinkling system, a carbon dioxide, or a foam system with sufficient hose to reach all parts of the deck where automobiles or motor vehicles are carried is installed, said systems to be installed in accordance with drawings or blueprints and specifications approved by the Coast Guard District Commander of the district having original jurisdiction

When a vessel is provided with enough fire extinguishers to take care of all the automobiles or motor vehicles that can be carried, no extra fire extinguishers shall be required for any number of motorcycles carried

Extra safety-valve units shall be carried on board for 50 percent of hand fire extinguishers of the foam type, and extra charges shall be carried on board for 50 percent of each class of fire extinguishers provided If 50 percent of each class of fire extinguishers carried gives a fractional result, extra charges and extra safety-valve units shall be provided for the next largest whole number.

Example

Fire ex- tinguishers carried	Extra charges required
1	1
2	1
3	2
4	2
5	3

Provided, however, That when provided with carbon-dioxide type of fire extinguishers either an additional carbon dioxide extinguisher or a 2½-gallon foam extinguisher may be furnished For that 2½-gallon foam extinguisher no extra charge will be required

There shall also be carried on board a complete recharge for any fixed or built-in fire-extinguishing system that has been approved by the Commandant, except systems for engine rooms, firerooms, and cargo holds

Fire extinguishers shall be located in such parts of the vessels as in the judgment of the Officer in Charge, Marine Inspection, will be most convenient and serviceable in case of emergency, and so arranged that they may be easily removed from their fastenings Every fire extinguisher thus provided for shall be discharged and examined at each annual inspection *Provided,* That carbon tetrachloride fire extinguishers shall be tested for their pumping efficiency and the liquid discharged with proper care so that it may be replaced in the extinguishers Carbon dioxide fire extinguishers shall be checked by weighing to determine contents, and, if found to be more than 10 percent under required contents of carbon dioxide, shall be recharged

Every fire extinguisher provided for and required by this section shall be tested by the Bureau of Standards, Department of Commerce, and a report made by that bureau to the Commandant, who shall then determine whether the said extinguisher shall be approved for use on vessels subject to inspection

Every fire extinguisher approved after September 5, 1933, for use on vessels under the jurisdiction of the Coast Guard shall have affixed thereto a metallic name plate having plainly stamped thereon the name of the fire extinguisher, the rated capacity in gallons, quarts, or pounds, and the name and address of person or firm for whom approved, and the identifying mark of the actual manufacturer

Recharges, particularly the acid, used in charging soda-and-acid type of fire extinguishers, must be packed in such manner that the filling operation (i e, in recharging the extinguisher) can be performed without subjecting the person doing the recharging to undue risk of acid burns and shall be contained in Crown stopper type of bottle

95 14 Fire equipment on vessels using oil as fuel On all passenger vessels there shall be fitted an approved carbon dioxide or foam-type system for extinguishing fire in the bilges of each fireroom If engine and boiler rooms are not entirely separate and fuel oil can drain from the boiler-room bilge into the engine room, the combined engine and boiler rooms shall be considered one compartment The system shall be capable of being operated from a convenient and accessible point outside the space protected.

When a carbon dioxide (CO₂) system is fitted, the quantity of carbon dioxide carried shall be sufficient to give a gas saturation of 25 percent of the gross volume of the largest boiler room from tank top to top of the boilers. The whole charge of gas shall be capable of being released instantaneously by operating one valve and control All cylinders must be completely discharged in not more than 2 minutes The arrangement of the piping shall be such as to give a general and fairly uniform distribution over the entire area protected

An alarm shall be provided to give a warning in the space when the carbon dioxide is about to be released. Provision shall be made to prevent the admission of air into the lower parts of the boiler room while the system is in operation.

When a foam-type system is fitted its capacity shall be such as to rapidly discharge over the entire area of the bilge (tank top) of the largest boiler room a volume of foam 6 inches deep. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected. The foregoing system may be of a type employing either two-solution tanks or one or more generators using an approved dry chemical mixture.

All containers and valves by which they are operated shall be easily accessible and so placed that they will not readily be cut off from use by an outbreak of fire.

In addition to the foregoing, there shall be provided 1 fire extinguisher of the foam type of at least 40 gallons rated capacity or 1 carbon dioxide (CO₂) of at least 100 pounds in steamships having 1 boiler room, and 1 such fire extinguisher in each additional boiler room. These extinguishers shall be equipped with suitable hose and nozzles on reels or other practicable means, easy of access and of sufficient length to reach any part of the boiler room and spaces containing oil-fuel pumping units. *Provided*, That on vessels of 750 gross tons and under, foam-type fire extinguishers of at least 20 gallons rated capacity or carbon dioxide (CO₂) of at least 50 pounds, fully equipped as the fire extinguishers above described, may be used.

At annual inspections, all carbon dioxide (CO₂) cylinders, whether fixed or portable, shall be examined externally and replaced if any corrosion is found, and also shall be checked by weighing to determine contents, and if found to be more than 10 percent under required contents of carbon dioxide, the same shall be recharged.

On all vessels of over 500 gross tons, using oil as fuel, there shall be in each fire room a metal tank containing 10 cubic feet of sand, fitted with a scoop or shaker, for fire purposes, also two or more approved fire extinguishers of the carbon dioxide (CO₂) type, of not less than 15 pounds capacity each, or two foam-type fire extinguishers of not less than 2½ gallons capacity each.

On all vessels of less than 500 gross tons, using oil as fuel, there shall be in each fire room a metal tank containing not less than 5 cubic feet of sand, fitted with a scoop or shaker, for fire purposes, also one carbon dioxide fire extinguisher of not less than 15 pounds capacity, or one foam-type fire extinguisher of not less than 2½ gallons capacity.

95.14a Water-sprinkling systems On and after December 31, 1916, all steamers carrying passengers, and which also carry freight upon the main deck which is accessible to passengers or crew while being navigated, shall have installed in such main-deck freight space an efficient overhead water-sprinkling system.

The crew and passenger sleeping accommodations located below the main deck on steamers engaged in the passenger traffic shall have installed therein an efficient overhead water-sprinkling system, unless such quarters and the bed frames therein are constructed of metallic or noncombustible material, thereby making them practically fireproof.

On steamers carrying passengers where the kitchens or galleys are located below the main deck, there shall be installed in such kitchens or galleys an efficient overhead water-sprinkling system. This paragraph shall become effective July 1, 1917.

The water-sprinkling system above referred to shall be reliable and efficient and so located that the volume of discharge shall be sufficient to entirely cover or blanket the freight in case of fire, and to entirely and fully sprinkle the compartment in which the passengers or crew may be accommodated below deck, and be installed in such manner as to be easily and quickly accessible of operation, and shall be ready for service at all times when freight or passengers are on board. The operating valves for the sprinkling system shall be suitably marked.

95 15 Fire-detecting, alarm, automatic sprinkler, and patrol systems; new and existing vessels (a) (1) All passenger vessels with berth or stateroom accommodations for 50 or more passengers shall be fitted, unless deemed unnecessary by the Commandant for the proper protection of life, with an automatic water sprinkling system of a type approved by the Commandant, which system shall be so installed as to protect all enclosed parts of the vessel accessible to passengers or crew while the vessel is being navigated, except cargo holds, machinery spaces, and when of fire-resisting construction, toilets, bath rooms, and spaces of similar construction

Where, in the case of a particular vessel, the Commandant does not consider the installation of an automatic water-sprinkling system necessary, such vessel shall be protected in such enclosed parts of the vessel as the Commandant shall deem necessary, with an automatic electric or pneumatic fire-detecting and alarm system, used singly or in combination, of a type approved by the Commandant

(2) All passenger vessels of more than 150 feet in length having berth or stateroom accommodations for less than 50 passengers, shall be fitted with an automatic fire-detecting and alarm system of a type approved by the Commandant. Such system may be electric pneumatic, automatic sprinkler or a combination of each

(b) (1) All passenger vessels having berth or stateroom accommodations for passengers shall be provided with an efficient supervised fire patrol system of an approved type which will record the time of each visit to each recording station, unless the stations are so interrelated as to require operation of all stations of a route in a fixed order, in which case the record shall show the time of start and finish of each tour

(2) The date of both the night and morning portions of the patrol shall be entered on the record. The records shall be available for review by inspectors for a period of 6 months after the date to which such records refer

(3) The station boxes shall have seals placed over the securing screws in order to leave evidence of removal or tampering. The number and location of recording stations, the order in which they are visited, and the number undertaken by one patrolman shall be approved by the Commandant

(4) Where the system is not equipped with a recording apparatus in the control station¹ the patrolman shall report to the bridge every hour

(c) All passenger vessels of more than 150 feet in length having berth or stateroom accommodations for passengers which are not equipped with a fire-detecting system in cargo spaces, shall be equipped with an approved smoke-detecting system in all cargo spaces which are inaccessible to passengers or crew while the vessel is being navigated. Cargo spaces which are accessible to passengers or crew while the vessel is being navigated shall be equipped with a water-sprinkling system

(d) All passenger vessels with sleeping quarters for passengers shall be provided with an approved manual fire-alarm system which operates alarm bells in the pilothouse, engine room, and emergency squad quarters where provided. The manual fire-alarm system shall be installed in accordance with the plans approved by the Commandant and shall have a suitable number of stations on all decks so as to enable the patrolman to give the alarm immediately in case of fire.

95 16 Fire-detecting and automatic sprinkling systems—(a) Provisions common to all systems—(1) General (i) All devices and equipment installed shall be of a type and character suitable for marine use, and shall be approved by the Commandant.

(ii) In addition, parts and samples of any equipment shall be submitted by the manufacturers for test purposes, upon request of the Coast Guard

¹ Those stations in which a 24-hour watch is maintained and in which, (1) navigating equipment is located, or (2) radio equipment is located, or (3) central fire station where fire-recording instruments are located.

(iii) Furthermore, all apparatus, devices, and circuits of/as a complete system shall withstand a 60-day endurance test without repair, one-half of which time shall be at sea service

(iv) Fire-alarm systems shall not be used for the transmission of other than fire-alarm signals

(v) Systems shall be normally free of electrical grounds

(vi) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the American Institute of Electrical Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions. All conductors shall be lead sheathed to protect against moisture, and conductors exposed to mechanical injury shall be leaded and armored. Lead-sheathed conductors may be used for voltages of 60 volts or less. In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermostats in each thermostat zone, but approved multiconductor cable may be used to connect the several individual zones to the annunciator panel

(2) Maintenance and test (i) With each equipment there shall be furnished a framed chart which shall be visible in the wheelhouse at all times, bearing full instructions for operation, maintenance, and test of the system

(ii) This chart shall bear tabulated spaces for the date and signature of a licensed officer of the ship who shall witness or conduct tests of the system at intervals not less frequent than required in the specification forming part of the Commandant's approval. It is recommended that periodic inspections be made by the manufacturer of the equipment

(iii) The chart shall list the minimum spare material which is required in each equipment in the specification forming part of the Commandant's approval

(3) Classification. Protection shall be provided by systems of the following types, used singly or in combination

(i) Electrical system, using thermostats or thermostat wire operating by heat to produce visual and audible signals

(ii) Pneumatic-tube system, using thermostats composed of copper tubing containing air, the expansion of which produces visual and audible signals

(iii) Smoke-pipe system, in which fire is indicated visually and by the sense of smell by smoke drawn through pipes and suitably illuminated

(b) Electrical and pneumatic-tube systems—(1) Scope of installations (i) For vessels 150 feet and under in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or in the engine room

(ii) For vessels above 150 feet and under 350 feet in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or chart room, and shall provide an auxiliary audible alarm in the engine room

(iii) For vessels 350 feet or more in length systems of these types shall provide one annunciator lamp or drop, or other suitable indicator for each fire-alarm circuit, this annunciator, together with an alarm bell, to be located in the wheelhouse or chart room or in a fire station in which a 24-hour watch is kept, and shall provide an auxiliary audible alarm in the engine room.

(iv) Annunciators or other indicators shall be clearly marked to show the fire-alarm circuit protected and shall indicate or function until manually restored

(2) Location of detectors, electrical system. (i) Detectors (thermostats) shall be installed overhead in the high point of each compartment protected. At least one detector shall be installed in each such compartment. Detectors (thermostats) shall not be approved for use in cargo compartments or other inaccessible places after June 30, 1933, unless satis-

factory provision is made to replace them without ingress to the compartment in which they are located

(ii) On smooth ceilings detectors shall be spaced not over 15 feet apart and the area protected by a single detector shall not exceed 200 square feet, and no point on the ceiling shall be more than 10 feet away from the detector. For the detectors of the wire type each circuit shall consist of a continuous length of thermostat wire not exceeding 1,000 feet in length. The thermostat wire shall extend into each compartment protected and no point on the ceiling shall be more than 10 feet away from the thermostat wire.

(iii) Thermostat wire shall be run directly on the ceiling or within 12 inches of the ceiling on partitions or bulkheads. In cargo compartments all fire-indicating apparatus shall be installed overhead and not on the ship's side or on bulkheads.

(iv) Ceilings divided into panels or bays by beams not more than 8 inches deep shall be regarded as smooth ceilings, otherwise each bay shall be regarded as a separate ceiling.

(v) Where these spacing requirements are impracticable because of unusual beam structures, special instructions shall be obtained from Headquarters.

(vi) All detectors in cargo spaces, or otherwise subject to mechanical injury, shall be suitably protected by substantial steel protectors crossing over in front of detectors and fastened to beams or brackets or the equivalent.

(vii) As required by the Coast Guard, from three to six spot thermostats for fire-detecting systems installed prior to January 1, 1935, and at subsequent intervals, shall be supplied for test purposes and if found lacking in sensitivity the entire installation of thermostats shall be replaced.

(3) **Location of detectors, pneumatic-tube system** (i) Each circuit shall consist of a continuous length of pneumatic tubing, not exceeding 1,000 feet in length, without branches or alternative paths.

(ii) Tubing shall be run directly on ceilings or within 12 inches of ceiling on partitions or bulkheads. In cargo compartments all fire-indicating apparatus shall be installed overhead and not on the ship's side or on bulkheads.

(iii) In every inclosed space or separate room there shall be exposed at least 5 percent of total length of tubing or circuit.

(iv) In no case shall less than 25 feet of exposed tubing be used in any inclosed space or separate room.

(v) On smooth ceilings no point on the ceiling shall be more than 12 feet from nearest point of tubing.

(vi) Ceilings divided into panels or bays shall be regarded as smooth ceilings, provided beams are not more than 8 inches deep, otherwise at least one line of tubing shall be run in each bay.

(vii) Where these spacing requirements are impracticable because of unusual beam structures, special instructions shall be obtained from Headquarters.

(viii) Where necessary, tubing shall be protected against mechanical injury.

(ix) Tubing shall be inclosed in conduit or otherwise heat insulated where this is necessary in order to properly isolate signals.

(4) **Zoning** (i) A single fire-alarm circuit shall not include more than 50 individual rooms or storage lockers.

(ii) Spaces separated by watertight or main vertical zone bulkheads shall not be included in the same fire alarm zone. Further, a fire alarm zone shall not include spaces on more than one deck except in the case of peak spaces having a combined ceiling area not exceeding 3,000 square feet, or in the case of a system with indicators for individual spaces.

(iii) Systems shall be so designed that one circuit becoming inoperative will not affect the operation of any other circuits.

(iv) The system shall be so arranged as to permit one or any number of fire-alarm signals simultaneously, and an alarm on any one circuit shall not interfere with the operation of any other circuit

(5) **Supervision** (i) The source of energy and all electrical circuits, except as hereinafter provided, shall be under constant electrical supervision. In event of failure of the source of energy or a break in any supervised circuit, a distinctive trouble signal or fire-alarm signal shall sound continuously until the trouble is corrected. No switch for silencing this signal shall be provided unless its operation transfers the signal to a trouble lamp

(ii) All trouble circuits, the source of energy for trouble circuits, and normally open secondary circuits on control panels incased in metal protection need not be supervised

(iii) The thermostats themselves need not be supervised if connected in multiple

(iv) A fire gong shall be supervised. When multiple fire gongs are used, at least one shall be supervised

(6) **Current supply.** (i) The source of energy for the fire-alarm system, including supervisory circuits, shall consist of a storage battery of sealed cells automatically charged from the main bus bars of the lighting system, and used for no other purpose

(ii) The supply voltage shall be not less than 20 volts. The system shall be able to operate at 80 percent of normal voltage

(iii) The capacity of the storage battery shall be sufficient to supply the system for at least 48 hours without recharging, and shall be not less than 10 ampere hours

(7) **Fuses** Approved fuses of not less than 3-ampere nor more than 6-ampere capacity shall be provided at or near the bus bars from which the charging current is taken and on charging panel in main discharge leads of battery

(8) **Control panels and devices.** (i) All panels and devices shall be capable of operating when inclined to an angle of 45°. Operation shall not be affected by vibration

(ii) Audible signals shall be produced on vibrating fire-alarm bells of inclosed type with gongs not less than 6 inches in diameter

(iii) Provision shall be made for silencing the fire-alarm bell by means of a switch operating when the door of the control-panel cabinet is open at least 3 inches, or by equivalent means

(c) **Smoke-pipe systems—(1) Scope of installations.** Systems of this type shall provide a detecting device to which all smoke pipes shall lead, which device shall be located in the wheelhouse, in a fire control station in which a 24-hour watch is kept, or in convenient proximity to the valves of the extinguishing system, provided there are transmitted to the wheelhouse or fire control station means for determining the compartment reporting the alarm and audible alarms are provided as required in this section

(2) **Construction and installation.** (i) The detecting device shall be such that finely divided and diluted particles of smoke shall be readily indicated visually. The lighting arrangement shall be such as not to be disturbing to navigation at night. For new installations on vessels of over 5,000 gross tons or where installations are not made in the wheelhouse or fire control station, this device shall be provided with an audible alarm in the wheelhouse together with an auxiliary audible alarm located in the engine room

(ii) Smoke collectors shall be installed overhead in each compartment protected and shall be so located that no point on the overhead deck is more than 40 feet from a collector. The indicating pipes or tubing shall be not smaller than three-fourths inch inside diameter. When more than one smoke collector is required for a compartment, not more than two collectors may be connected to one indicating pipe. Each compartment shall have one or more indicating pipes extending to the detecting device, except that the pipes from small adjacent compartments not exceeding a combined volume of 5,000 cubic feet may be joined

No smoke collectors shall be located nearer to the edge of the opening of a ventilator than three times the diameter or equivalent diameter of the opening

(iii) Sufficient quantity of the exhaust shall discharge into the wheelhouse or fire station to permit the detection of fire by odor, and a valve plainly marked and readily operable from that compartment shall be provided to direct the exhaust, if obnoxious, to the outside. Where the detecting cabinet is not installed in the wheelhouse or fire station the residual exhaust shall be discharged in the vicinity of the detecting cabinet

(iv) Suction fans shall be furnished in duplicate, and shall be provided with switches to permit their operation from the emergency lighting circuit. Where the emergency lighting voltage is less than the normal lighting voltage, one fan shall be so arranged that it may be operated from either source

(v) A trouble signal located in the fire control station or the wheelhouse shall be provided which will indicate the inability of the system to report a smoke alarm

(vi) Where exposed to injury in cargo compartments the collectors and smoke pipes shall be reasonably protected against injury

(vii) All smoke pipes shall be installed to grade to low points and at low points provided with drains. These pipes shall be run with as easy bends as practicable

(viii) The smoke inlets in cargo holds should be examined periodically by the ship's personnel to determine whether inlets are obstructed by corrosion, paint, dust, or other extraneous condition. Smoke tests should be made in all holds and the operation of the system noted

(d) **Automatic sprinkling system.** (1) The sprinkling system shall, where practicable, consist of pipes fitted with sprinkler heads at suitable distances that will operate automatically in the event of a fire, and spray water on the surrounding area

(2) The system shall be supplied primarily by a pressure tank or tanks of suitable capacity and maintained at the required pressure, and secondarily by an automatically controlled pump so arranged that when the pressure in the tank falls to a predetermined point the pump will cut in. Where a motor-driven sprinkler pump is installed, it shall be capable of being operated from the emergency electrical circuit in case of failure of the main power. Any water standing in the system or the tank should be fresh, and in the event the supply to the pump is salt water, appropriate check valves shall be installed to prevent the salt water entering the tank. Provision should be made to cut in any additional pumping equipment under manual control

(3) Sprinkler systems shall be zoned, and means shall be provided for giving an alarm where it can be most quickly observed by officers or crew in case of water flow from sprinklers, low air pressure, closed supply valves, or operation of thermosensitive elements

(4) The automatic sprinklers, alarm valves, and other fire-protection devices to be used in the above system shall be of a type approved by the Commandant, and the entire system shall be installed in accordance with drawings and specifications approved by the Commandant

(5) All tanks installed on or after January 1, 1939, for use in connection with sprinkler systems shall be constructed, tested and inspected as unfired pressure vessels in accordance with the provisions of Parts 50 to 57, inclusive, of this chapter. All such tanks which were installed prior to January 1, 1939, shall be tested and inspected as unfired pressure vessels in accordance with the provisions of Parts 50 to 57, inclusive, of this chapter

95.17 Oxygen-breathing apparatus, gas masks, and flame-safety lamps. All passenger vessels which are provided with sleeping quarters for passengers shall be provided with oxygen-breathing apparatus, gas masks, and flame-safety lamps, as follows

(a) Vessels with 50 to 100 staterooms for passengers, 2 oxygen-breathing apparatus or 2 gas masks.

(b) Vessels with more than 100 staterooms for passengers, 4 oxygen-breathing apparatus or 4 gas masks and a flame-safety lamp

(c) Oxygen-breathing apparatus or gas masks shall be kept in operative condition and in the following places. Vessels coming under paragraph (a), one shall be in the pilothouse, and one in the engine room. Vessels coming under paragraph (b), two shall be kept in the pilothouse, one in the engine room, one in the wireless room, or on vessels not equipped with wireless, two shall be kept in the engine room.

(d) The master and chief engineer shall train a sufficient number of officers and crew in their respective departments in the use of the equipment.

(e) Only oxygen-breathing apparatus and flame-safety lamps that have been approved by the Commandant may be used.

(f) Oxygen-breathing apparatus shall be of at least ½-hour-period type, and gas masks shall have the approval of the Commandant.

(g) One extra cylinder for each oxygen-breathing apparatus and one extra canister for each gas mask shall be carried.

(h) The gas mask mentioned above shall be of an approved type which provides full protection against carbon monoxide and other gases.

(i) All vessels equipped with refrigeration of any kind shall carry one gas mask of a kind giving protection against the refrigerant used, in addition to the breathing apparatus.

95 20 Lubricating oils. Lubricating oils for use on board the vessel shall be stored in secure tanks, casks, or cans in the engine-room compartments or storeroom, or in metal-lined lamp lockers or oil rooms. Effective on and after April 9, 1941.

95 21 Fire extinguishers for emergency power plants. In compartments where emergency lighting and wireless units are located, two approved fire extinguishers of either carbon tetrachloride, carbon dioxide, or foam type shall be permanently located at the most accessible points. In addition, two fire extinguishers of the above types shall be permanently located so as to be readily accessible to the emergency fuel tanks containing gasoline, benzene, or naphtha.

95 21a Fire-resisting bulkheads. On and after July 1, 1931, all passenger vessels shall be fitted above the bulkhead deck with fire-resisting bulkheads which shall be continuous from side to side of the vessel and arranged to the satisfaction of the Commandant. The mean distance between any two adjacent fire-resisting bulkheads in any superstructure shall, in general, not exceed 131 feet. For additional requirements see Part 144—Construction or Material Alteration of Passenger Vessels of the United States of 100 Gross Tons and Over Propelled by Machinery, Chapter I, Title 46, Code of Federal Regulations.

95 22 Construction of motion picture booths—(a) Booths. Apparatus for projecting motion pictures using inflammable (nitrocellulose) film or slow-burning (acetate cellulose) film shall be contained in a fire-resistive booth or enclosure. It shall be not less than 7 feet in height and of horizontal area not less than 30 square feet for each projector. It shall not be located nearer than 10 feet to the principal exits of the room.

(1) **Construction of booth.** The framework shall be constructed of structural steel angles or T irons not less than 1½ inches by 1½ inches by ¼ inch, spaced not more than 2 feet apart, or 2 inches by 2 inches by ¼ inch, when spaced from 2 feet to 4 feet apart, and shall be suitably braced to withstand lateral strains. It shall be securely anchored to the deck. The top and sides of the booth shall be covered on the inside of the steel frame with a metal sheet not thinner than No. 20 gage, inside of which is placed asbestos millboard not less than one-fourth inch thick, all properly secured to the framework. Transite asbestos boards or asbestos wood may be used without the sheet-metal covering, provided the distance between supports for the ¼ inch thickness does not exceed 2 feet, for the ¾ inch thickness, 3 feet, for the 1½ inch thickness, 4 feet. The door shall be constructed similar to the booth, and shall

be not less than 2 feet wide and 5 feet high, shall be self-closing, fit its frame tightly, and be provided with proper latches. The floor shall be covered with one thickness of three-eighth-inch asbestos millboard or transite board.

All joints shall be made smoke proof.

(2) **Openings in booth.** The booth shall be provided with a ventilating inlet on each of the three sides, each to be about 15 inches long and 3 inches high, covered on the outside with wire netting of mesh not greater than $\frac{1}{8}$ inch, securely fastened to the wall. In the top of the booth shall be located an air-outlet opening of not less than 100 square inches for each projector connected by a fire-resistive flue to a safe distance above the top deck if the booth is located below deck. The flue shall be securely supported on the framework of the booth. This is designed to provide for an air current through the booth, when operating, of 30 or more cubic feet per minute. If in the given location this is not accomplished, artificial ventilation, as by means of a fan within the booth, shall be introduced.

Two openings shall be provided at the front of the booth, one for the machine and the other for observation by the operator, the maximum area of each opening not to exceed 70 square inches. These openings as well as the air inlets near the bottom of the booth shall be provided with gravity doors made of iron or steel not less than $\frac{1}{8}$ inch in thickness, of size to overlap the openings by at least 2 inches, and arranged to slide without binding in properly constructed grooves, the joint between door and wall to be smoke-tight when doors are closed, said doors to be held open normally by the use of a fine combustible cord fastened to a fusible link located above the projector which melts at a temperature of 71° C. (160° F.), the whole being so arranged that the doors will close automatically upon severing of the cord or the fusing of the link. Provision shall also be made for closing said doors by hand from the outside of the booth.

(3) **General requirements.** All films on board shall at all times be kept within the operating booths, except as otherwise herein provided. They shall be contained in individual metal boxes, except for the film in the machine and the film immediately before it is placed in or immediately after removal from the machine. Where not over five 5-pound reels are present in the booth they may be placed on incombustible shelves, suitably secured against displacement by the motions of the boat. Where more than 5 reels but not more than 10 reels are present, they shall be kept in closed shelves or cabinets similar in construction to that of the walls of the booth. Where more than ten 5-pound reels are present, they are to be stored in an insulated film cabinet, the cabinet to be constructed per appended specifications.

All rewinding and repair of film shall be conducted within the projecting booth, unless a place with equal safeguards is provided.

When in use the door of the booth shall be closed and when not in use it shall be locked.

The projecting machine is to be suitably secured against displacement by the motions of the boat. All electric wiring and connections shall conform with accepted standards for the given purpose (National Electric Safety Code or National Electric Code). No smoking, matches, or lights other than properly guarded electric lights shall be permitted within the booth.

(b) **Cabinets.** (1) The size of a cabinet for the temporary storage of films on board shall not exceed 10 cubic feet, and shall not be used for storage at one time of more than forty 5-pound reels. The reels shall be contained within suitable metal containers and be held on racks in such manner as not to be displaced by the motions of the boat.

(2) The cabinet shall be constructed of incombustible materials throughout and shall be tightly inclosed. It may be of sheet iron of not less than No. 18 U. S. gage, stiffened with angle irons, double walled, with not less than 2 inches of space between walls, filled with incombustible insulating material, or equivalent construction. The door shall be constructed equivalent to the walls of the cabinet, shall be self-closing, fit closely, and be

kept closed and locked at all times except when films are being removed from or placed in the cabinet. If the cabinet is located within the booth, the door of the cabinet shall open outward through the wall of the booth, with tight joints between the booth wall and the cabinet or door. The cabinet shall otherwise be kept in a hold for the storage of hazardous materials. The cabinet shall be secured to the deck by fastenings attached to the outer angle irons.

(c) **Fire extinguisher required.** At least one fire extinguisher of a kind approved by the Commandant shall be placed near every such booth and be accessible at all times.

(d) **Motion-picture projectors.** (1) Motion-picture projectors of the 16 mm. or 8 mm size, using only slow burning films, need not be of an approved type and may be used on inspected vessels without booths.

(2) Motion-picture projectors using the 35 mm size films shall only be used in booths constructed in accordance with the specifications in paragraph (a) of this section and must be of an approved type.

95.23 Regulations to guard against and extinguish fire reestablished. The regulations in this part to guard against and extinguish fire, in effect on April 8, 1941, established under the authority of Title LII of the Revised Statutes of the United States (R. S. Sections 4399-4500, inclusive), are hereby reestablished under the authority of section 2 (a) of the Act of October 9, 1940 (46 U. S. C. 463a), and effective on and after April 9, 1941.

95.24 Liquefied petroleum gases for cooking and heating—(a) Liquefied petroleum gas (definition) For purposes of this section "liquefied petroleum gas" shall be defined as any liquefied inflammable gas which is composed predominantly of hydrocarbons or mixtures of hydrocarbons such as propane, propylene, butanes, butylenes, and butadienes, and which has a Reid ¹ vapor pressure exceeding 40 pounds per square inch absolute or a vapor pressure exceeding 25 pounds per square inch gage at 100° F, as determined by the Natural Gasoline Association of America ² method or other recognized test method.

(b) **Approvals.** Liquefied petroleum gas may be used on inspected vessels, except passenger vessels, *provided*,

(1) Gas consuming appliances are approved for use of liquefied petroleum gas by the American Gas Association Testing Laboratories (as indicated by label or seal of approval for liquefied petroleum gas on stationary installations) and are also approved by the Commandant.

(2) Cylinders or drums in which liquefied petroleum gas is stored and handled shall comply with Interstate Commerce Commission specifications and retest requirements for the specific gas filled therein.

(3) The relief valves, shut off valves, excess flow valves, pressure regulators, and vaporizer, when used, shall conform to the requirements of, and bear the label of the Underwriters Laboratories, Inc., or other recognized testing laboratory.

(4) The location and installation of gas burning appliances, gas cylinders and regulating equipment, together with all piping must be approved by the Commandant.

(c) **Odorization of gas.** All liquefied petroleum gas used on vessels shall be effectively odorized by an agent of such character as to indicate positively by a distinctive odor the presence of gas down to a concentration in air of not over $\frac{1}{4}$ the lower limit of combustibility.

(d) **Location and securing of containers.** (1) Cylinders shall be located in a substantially constructed and firmly fixed metal inclosure located on or above the weather deck level. Access to this inclosure shall be from the weather deck only. This inclosure shall be so constructed that when the access opening is closed any gas leakage can escape only

¹ American Society for Testing Materials Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method) (D-323) most recent revision.

² Natural Gasoline Association of America Tentative Standard Method for Determination of Vapor Pressure of Liquefied Petroleum Gas Products, most recent revision.

through a top and bottom ventilating system which shall consist of a fresh air inlet pipe and an exhaust pipe both entering the inclosure from above

(2) Cylinders or drums located within the metal inclosure shall be suitably secured in place

(3) Storage of spare and empty cylinders must be within the metal inclosure or they must be properly checked on the weather deck

(e) **Valves and regulators** (1) A spring loaded relief valve shall be incorporated in the system, its size and pressure setting to be according to Interstate Commerce Commission's requirements, and it shall be located and vented within the metal inclosure This relief valve must be located on or between the cylinder and the pressure regulator

(2) The low pressure side of all pressure regulators shall be protected against excessive pressure by means of a suitable relief valve which shall discharge into the metal inclosure

(3) All regulator vents must discharge into the metal inclosure

(4) All valves and regulators embodied in the system for the purpose of pressure relief, regulation and control of gas pressure and flow rates, shall be securely mounted in positions readily accessible for inspection, maintenance, and testing

(5) Valves in the assembly of multiple cylinder systems shall be so arranged that the change of cylinders may be made without shutting down the system

(6) A shut off valve shall be installed in each branch connection

(f) **Vaporizers** Where a vaporizer is required approval shall be obtained from the Commandant

(g) **Piping and fittings** (1) All piping shall be installed so as to provide minimum interior runs with adequate flexibility

(2) The piping between the cylinders and the appliances shall be seamless annealed copper tubing or any other tubing approved by the Commandant The tubing connections shall be flared and the number held to a minimum

(3) All piping or tubing shall be tested (such as with a manometer employing water) after assembly and at each annual inspection and proved free from leaks at not less than normal operating pressures Tests may be made by qualified persons acceptable to the Officer in Charge, Marine Inspection, and one copy of a report of such test shall be posted and another forwarded to the Officer in Charge, Marine Inspection, in the district in which the test was made

(h) **Ventilation of compartments having gas appliances.** (1) Compartments which are located above the weather deck and which contain gas consuming devices shall be ventilated by openings to the outside near the deck level and by openings overhead or near the overhead in the compartment Mechanical ventilators may also be provided

(2) Where compartments in which gas consuming devices are located are entirely below the weather deck, mechanical ventilation shall be provided with sufficient capacity to effect a change of air at least once every six minutes

(i) **Identification and instructions.** (1) The outside of metal inclosure housing liquefied petroleum gas cylinders, valves and regulators shall be marked

Liquefied Petroleum Gas
Keep Open Fires Away
Operating Instructions
Inside and In _____

(2) Operating Instructions shall be framed under glass and shall be posted prominently, both in the interior of the metal inclosure and near the most frequently used gas consuming device, so they may be easily read.

(j) **Operating instructions** (1) Before opening a cylinder valve, the outlet of cylinder shall be connected tightly to system, and, in the case where only a single cylinder is used in the system, all appliance valves and pilots must be shut off before the cylinder valve is opened

(2) Before opening cylinder valve after connecting it to system, the cylinder shall be securely fastened in place

(3) When cylinders are not in use their outlet valves shall be kept closed

(4) Cylinders when exhausted shall have their outlet valves closed

(5) Nothing shall be stored in the metal inclosure except liquefied petroleum gas cylinders and permanently fastened parts of the system

(6) Valve protecting caps if provided shall be firmly in place on all cylinders not attached to the system Caps for cylinders in use may remain in metal inclosure if rigidly fastened to the metal inclosure structure

(7) The opening into the metal inclosure must be closed at all times except when access is required to change cylinders or maintain equipment

(8) Gas pressure to consuming devices should be approximately eleven inches water column (6 4 oz per square inch)

(9) No smoking should be permitted in the vicinity of the metal inclosure when access to inclosure is open

(10) If electric connections are made within the metal inclosure they must be installed in strict accordance with the requirements of the National Electrical Code¹ for Class I, Group D, Hazardous Locations

(11) Tests for gas leaks should be made with a soap solution or low freezing point liquids but in no case shall a flame be used

(12) Report any presence of gas odor to _____

¹ A copy of this Code, National Board of Fire Underwriters' Pamphlet No 70, has been filed with this document in the Division of the Federal Register, the National Archives, Washington, D C Copies are also on file with various Coast Guard District Commanders for reference purposes

PART 96—SPECIAL OPERATING REQUIREMENTS

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CROSS REFERENCE

Definition of terms See § 94 01

Note: The rules and regulations regarding the examinations for and the issuing of licenses, certificates, raising of grade, etc., and other matters relative to merchant marine personnel are contained in a separate publication entitled, "Rules and Regulations for Licensing and Certificating of Marine Personnel."

96 12a Notice to mariners, aids to navigation. (a) Licensed officers are required to acquaint themselves with the latest information published by the Coast Guard and the United States Navy regarding aids to navigation, and neglect to do so is evidence of neglect of duty. It is desirable that vessels navigating oceans and coastwise and Great Lakes waters shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners. All vessels shall have charts of the waters on which they operate available for convenient reference at all times.

(b) Notice to Mariners published weekly by the Coast Guard which contains announcements and information regarding aids to navigation and charts of waters of the United States is available for free distribution at the following places: Field offices of the Coast Guard, United States Coast and Geodetic Survey field stations, and the Marine Division, Customhouse. Notice to Mariners published weekly by the United States Navy for the correction of charts, sailing directions, light lists and other publications, and which includes foreign waters and certain waters of the United States, is available for free distribution at the Hydrographic Office, Branch Hydrographic Offices, or any of the agencies of seaboard ports, and is also on file in the United States consulates where they may be inspected.

96.16 Notice of casualty and voyage records. (a) The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the U S Coast Guard whenever the casualty results in any of the following:

- (1) Damage to property in excess of \$1,500 00
- (2) Material damage affecting the seaworthiness or efficiency of a vessel.
- (3) Stranding or grounding
- (4) Loss of life.
- (5) Injury causing any persons to remain incapacitated for a period in excess of 72 hours.

(b) The notice required in the above paragraph shall show the name and official number of the vessel involved, the owner or agent thereof, the nature and probable cause of the casualty, the locality in which it occurred, the nature and extent of injury to persons and the damage to property

(c) In addition to the notice required above, the person in charge of the vessel shall, as soon as possible, report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival *Provided*, That when from distance it may be inconvenient to report in person it may be done in writing only The written report required herein for personal accident not involving death shall be made on Form CG-924E and for all other marine casualties or accidents the written report shall be made on Form CG-2692

NOTE If filed without delay these forms may also provide the notice required by paragraph (a) of this section

(d) The owner, agent, master, or other person in charge of any vessel involved in a marine casualty shall retain such voyage records of the vessel as are maintained by the vessel, such as both rough and smooth deck and engine room logs, bell books, navigation charts, navigation work books, compass deviation cards, gyrocompass records, stowage plans, record of draft, aids to mariners, radiograms sent and received, the radio log and crew and passenger lists The owner, agent, master, or other officer in charge, shall make these records available to a duly authorized Coast Guard officer or employee for examination upon request

(e) Whenever a vessel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection No report on Form CG-2692 is required unless any of the results listed in paragraphs (a) (1) to (a) (5), inclusive, of this section occurs

96.17 Persons allowed in pilothouse and on navigation bridge Masters and pilots of vessels carrying passengers shall exclude from the pilothouse and navigator's bridge of such vessels, while under way, all persons not connected with the navigation of such vessels *Provided*, That inspectors of the Coast Guard, licensed officers of vessels, persons regularly engaged in learning the profession of pilot, officers of the Coast Guard, United States Navy, United States Coast and Geodetic Survey, and Engineer Department of the United States Army, may be allowed in the pilothouse or upon the navigator's bridge upon the responsibility of the officer in charge

The master of every such passenger and ferry vessel shall keep three printed copies of this section posted in conspicuous places on such vessel, one of which shall be kept posted in the pilothouse

Such printed copies shall be furnished by Headquarters to Officers in Charge, Marine Inspection, for distribution

96.18 Station bills, drills, and reports of masters—(a) Station bills and muster lists It shall be the duty of the master of every vessel carrying passengers and all other vessels of over 500 gross tons and subject to inspection, to cause station bills and muster lists to be prepared which shall be signed by the master who shall be responsible for their preparation The station bills and muster lists shall be posted in conspicuous places in several parts of the vessel, particularly in the crew's quarters, and must contain full particulars of the signals which will be used for calling the crew to their stations for emergency duties Special duties shall be allotted to each member of the crew and the muster lists shall show all these special duties and indicate the station to which each man must go and the duties he has to perform The special duties should, as far as possible, be comparable to the regular work of the individual On passenger vessels where the size of the crew will permit, several members of the crew should be designated as an emergency squad and required to report to the bridge with

certain equipment for instructions. The duties provided for by the muster lists should include

(1) The closing of airports, watertight doors, fire doors and fire screens, the covers and all valves of all scuppers, sanitary and other discharges which lead through the ship's hull below the margin line, and stopping the fans and ventilating systems

(2) The extinction of fire

(3) The equipment of boats, rafts, and buoyant apparatus and their preparation for launching

(4) The muster of passengers

(i) Warning the passengers

(ii) Seeing that they are dressed and have put on their life jackets in a proper manner

(iii) Assembling the passengers and directing them to the appointed stations

(iv) Keeping order in the passages and on the stairways and generally controlling the movements of the passengers

(b) **Emergency signals** The general fire alarm signal shall be a continuous rapid ringing of the ship's bell for a period not less than 10 seconds supplemented by the continuous ringing of the general alarm bells for not less than 10 seconds. For dismissal from fire alarm stations, the general alarm bells shall be sounded three times, supplemented by three short blasts of the whistle. The signal for boat drill or boat stations shall be more than six short blasts and one long blast of the whistle supplemented by the same signal on the general alarm bells

Where whistle signals are used for handling boats, they shall be as follows

To lower boats one short blast of the whistle

To stop lowering the boats two short blasts of the whistle

For dismissal from boat station three short blasts of the whistle. *Provided, That on river vessels the whistle signals herein may be made on the ship's bell*

The master of any vessel may establish such other emergency signal, in addition to the above, as will provide that all the officers and all the crew and passengers of the vessel will have positive and certain notice of the existing emergency

(c) **Emergency squad.** The master may organize a squad to be used for emergency duties (other than a general emergency), or crew practices, and the nature of the signals or other means for assembling the squad remains within the discretion of the master. Such signals should not conflict with the navigational signals or the signals used for a general alarm

(d) **Drills, tests and inspection** It shall be the duty of the master or the mate, or officer next in command, once at least in each week, to call all hands to quarters and exercise them in discipline, and (weather permitting) in the unlashng and swinging out of the lifeboats, the closing of all hand- or power-operated watertight doors which are in use at sea, closing all fire doors and fire screens, the use of fire pumps, and all other apparatus for the safety of life on board of such vessels, with special regard for the drill of the crew in the method of adjusting life preservers and educating passengers and others in this procedure, and to see that all the equipments required by law are in complete working order for immediate use, the fact of exercise of the crew, as herein contemplated, shall be entered upon the vessel's log book

The rule relating to fire and boat drills contemplates that such drills shall be conducted precisely as though an emergency existed. To accomplish the purpose of the rule, lifeboat covers and strongbacks shall be removed, plugs or caps put in place, boat ladders secured in position for use, painters carried forward and tended so as to provide a good lead and slack to hold the boat in position under the davits when in the water. The person in charge of each lifeboat or life raft should have a list of its crew and should see that the men under his orders are acquainted with their several duties. The hand pumps and fire pump shall be

operated long enough and a sufficient number of outlets used to ensure that such equipment is in order and effectual. The motor and the hand-operated propeller gear of each lifeboat shall be operated for a period of not less than 5 minutes once at least in every 7 days, in order that it may be ready for service at any time. Such operation shall be a part of the lifeboat drill, and the fact of such operation shall be made a part of the report of such drill. When oxygen-breathing apparatus, gas masks, or other special equipment is carried certain members of the crew shall be trained in the use of the equipment.

(e) **Log book entries.** The entries in the vessel's log book relating to the exercise of the crew in fire and boat drills shall state the day of the month and the hour when so exercised, length of time of the drill, number on the boats swung out, number of lengths of hose used, and a statement of the condition of all fire and lifesaving apparatus.

(f) **Penalty.** For any neglect or omission on the part of the officer in command of such vessels, to strictly enforce the provisions of this section, he may be proceeded against in accordance with the provisions of section 4450, R. S., as amended, looking to a suspension or revocation of his license.

(g) **Additional requirements.** It shall be the duty of the inspectors to require the officers and crew of all such vessels to perform the aforesaid drills and discipline in the presence of said inspectors at intervals sufficiently frequent to assure the said inspectors, by actual observance, that the foregoing requirements of this section are complied with.

The master of every passenger vessel shall report monthly the day and date of such exercise and drill, the number of lifeboats on board and the number on the boats that were swung out at each drill, the condition of the vessel and her equipments, and also the number of passengers carried. These reports shall be made to the office of the Coast Guard District Commander of the district where the vessel was last inspected. That officer will forward the reports to the Officer in Charge, Marine Inspection, in which district the vessel operated during the greater part of the month to which the report relates, through the office of the proper Coast Guard District Commander.

Three copies of this section shall be furnished every vessel carrying passengers and one to all other vessels to which this section applies, to be framed under glass and posted in conspicuous places about the vessel.

96.19 Steering gear tests. On all vessels under the jurisdiction of the Coast Guard, the entire steering gear, the whistle, the means of communication, and the signaling appliances between the bridge or pilothouse and engine room shall be examined and tested by a licensed officer of the vessel at least once in every week and an official record kept of the fact and time of such examination and test.

96.19a Steering orders. "Right rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the right.

"Left rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the left.

Where rudder indicators are provided, they shall be installed consistent with the foregoing.

96.20 Cargo hatches. It shall be the duty of the master of any vessel under the jurisdiction of the Coast Guard to assure himself before proceeding to sea that all exposed cargo hatches of his vessel are properly covered.

The covers shall be made watertight by the use of pliable gaskets or by heavy canvas tarpaulins thoroughly covering the hatch covers and firmly secured in place by battens which shall be securely fastened by toggles or wedges or by the use of efficient screw fastenings.

Failure by the master of any such vessel to observe this section shall be sufficient cause for suspension or revocation of his license on a charge of inattention to his duty.

96 21 Cable and lanyard. On all vessels subject to inspection where the distance is more than 150 feet between deck houses, a wire cable shall be stretched between the deck houses at all times when the vessel is loaded and being navigated, this cable to be not less than 5 feet from the deck, and there shall be attached at all times to the cable a traveler with a line of sufficient continuous length to insure its operation, in order that communication between both ends of the vessel may be facilitated at all times *Provided*, That, in addition to the traveler with the endless whip, as many loose rings with lanyards attached may be placed on the cable as may be deemed necessary by the master in charge of the vessel. Failure to have such cable stretched and traveler attached at all times when the vessel is loaded and being navigated shall be sufficient cause for the suspension of the license of the master or officer in charge *Provided*, That a fore and aft raised bridge shall be accepted in lieu of the wire cable and traveler.

96 22 Pilothouse watch All passenger and ferry steamers shall, in addition to the regular pilot on watch, have one of the crew also on watch in or near the pilothouse, and this rule applies to all steamers navigating in the nighttime.

Nothing in this section shall exonerate any master or officer in command from the consequences of any neglect to keep a proper lookout or the neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case.

96 23 Cabin watchmen and fire patrolmen. Vessels carrying passengers shall during the nighttime keep a suitable number of watchmen in all passenger quarters and on each deck.

All watchmen shall be under the direct charge of the master or officer in command of the vessel, and each shall report to the officer in command at the pilothouse at fixed intervals of not longer than every hour.

Cabin watchmen and cabin patrols on duty in the nighttime on all vessels shall have in their possession while on such patrol duty a suitable and efficient dry-battery flashlight.

The uniform of the night watchman shall be so conspicuous as to be readily distinguished from other persons, and the coat or sweater marked with a rating badge worn on the left sleeve marked "Watchman," and front of cap marked "Watchman."

Watchmen or patrolmen shall not be required to perform any other duty while on watch.

On all passenger vessels having berth or stateroom accommodations for passengers there shall be maintained while passengers are on board an efficient fire patrol so as to completely cover all parts of the vessel accessible to passengers or crew, at 20-minute intervals between the hours of 10 00 p. m. and 6 00 a. m., except machinery spaces, occupied passenger or crew sleeping accommodations, and cargo compartments which are inaccessible to passengers or crew while the vessel is being navigated.

Failure of a patrolman to follow a prescribed route, or to record each station within a definite time shall be entered on the record, along with the reason for the irregularity.

The patrolman shall report to the bridge every hour on vessels where the fire patrol system is not equipped with a recording apparatus in the control stations. In vessels requiring more than one patrol route, one patrolman may contact the others and make the joint report to the bridge.

A patrolman while on duty shall have no other tasks assigned to him. He shall be provided with a flashlight and shall wear a distinctive uniform or badge.

In the case of vessels of nonflammable construction which are fitted with an approved automatic fire-detecting and alarm system in public spaces, the patrol throughout the entire patrolled area may be at 1-hour intervals.

96.24 Unnecessary whistling Unnecessary sounding of vessel's whistle is prohibited within any harbor limits of the United States. Whenever any licensed officer in charge of any vessel shall authorize or permit such unnecessary whistling, such officer may be pro-

ceeded against in accordance with the provisions of R S 4450 (46 U S C 239), as amended, looking to a revocation or suspension of his license

96 25 Unauthorized lights Any master or pilot of any vessel who shall authorize or permit the carrying of any light, electric or otherwise, not required by law that in any way will interfere with distinguishing the signal lights may be proceeded against in accordance with the provisions of R S 4450, as amended, looking to a revocation or suspension of his license

96 26 Flashing the rays of a searchlight or other blinding light Flashing the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way is prohibited Any person who shall flash or cause to be flashed the rays of a blinding light in violation of the above may be proceeded against in accordance with the provisions of R S 4450, as amended, looking to the revocation or suspension of his license or certificate

96 27 Sanitation It shall be the duty of the master and chief engineer of any vessel under the jurisdiction of the Coast Guard to see that such vessel and the passengers' and crew's quarters are kept in a sanitary condition Failure on the part of the master (or chief engineer so far as it applies to the engineers' department) of any vessel to observe and carry into effect this section shall be sufficient cause for the suspension of his license on a charge of inattention to his duties

96 28 Steam vessels requiring licensed masters. There shall be a duly licensed master on board every steam vessel of more than 150 gross tons, subject to the inspection laws of the United States, whenever such vessel is under way

96 33 Duties of mates of inland steamers It shall be the duty of the mate of every inland steamer carrying passengers to assign to deck or steerage passengers the space they may occupy on board during the voyage, and to supervise the stowage of freight or cargo, and see that the space set apart for passengers is not encroached upon He shall also carefully examine all marks on packages of freight delivered on board for shipment, with a view to detect and prevent any combustible or other dangerous articles prohibited by law being delivered on board One copy of this section shall be furnished every steamer to which this section applies, to be framed under glass and posted on the main deck

96 37 Tonnage of steam vessels on which pilots may act. (a) The navigation of every steam vessel of more than 150 gross tons shall be under the control of a first-class pilot

(b) A first-class pilot, or a second-class pilot who has reached the age of 21 years, may act as master or pilot in charge of navigation of a steam vessel not exceeding 150 gross tons

(c) A second-class pilot is authorized to act as pilot in charge of a watch on any steam vessel within the qualifications specified in his license

96 38 Pilots governed by rules Pilots of steam vessels, while in the discharge of their duties, shall be governed by the rules of the Commandant, made for their guidance, and not by any instructions emanating from any inspector or other person

96 51 Examination of boilers and machinery by engineer It shall be the duty of an engineer when he assumes charge of the boilers and machinery of a vessel to examine the same forthwith and thoroughly, and if he finds any part thereof in bad condition, he shall immediately report the facts to the master, owner, or agent, and to the Officer in Charge, Marine Inspection, of the district, who shall thereupon investigate the matter, and if the former engineer has been wilfully negligent in the performance of his duties, he may be proceeded against under the provisions of R S 4450, as amended, looking to a suspension or revocation of his license

96 52 Reports of accidents, repairs, and unsafe boilers and machinery by engineers Before making repairs to a boiler of a steam vessel the engineer in charge of such steamer

shall report, in writing, the nature of such repairs to the Officer in Charge, Marine Inspection, of the district wherein such repairs are to be made

And it shall be the duty of all engineers when an accident occurs to the boilers or machinery in their charge tending to render the further use of such boilers or machinery unsafe until repairs are made, or when, by reason of ordinary wear, such boilers or machinery have become unsafe, to report the same to the Officer in Charge, Marine Inspection, immediately upon the arrival of the vessel at the first port reached subsequent to the accident, or after the discovery of such unsafe condition by said engineer *Provided, That*, during the period when a state of war exists between the United States and any foreign nation, communications in regard to accidents shall be handled with caution, and the above-mentioned reports shall not be made by radio or telegram

PART 97—INSPECTION OF VESSELS

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CROSS REFERENCE

Definition of terms See § 94 01

Section 97.1 Application for inspection of vessels, exemption of vessels while laid up or dismantled. The annual inspection of any vessel subject to the provisions of Title 52, Revised Statutes of the United States, shall be made only on written application, presented to the Officer in Charge, Marine Inspection, by the owner, master, or authorized agent of the vessel to be inspected. Such application shall state upon its face that previous application for inspection has not been made to any other inspector.

Vessels while laid up and dismantled and out of commission are exempted from any or all inspections required under Sections 4417, 4418, 4426, and 4427 of the Revised Statutes of the United States (46 U S C 391, 392, 404, 405).

All vessels or other floating equipment used by or in connection with any "civilian nautical school" as defined by section one of the Act of Congress approved June 12, 1940 (54 Stat 346, 46 U S C 1331) shall, whether being navigated or not, be subject to all the laws covering the inspection of passenger vessels in effect on or before June 12, 1940, and the regulations thereunder, including the inspection of hulls, the installation and inspection of machinery and boilers, lifesaving and fire-fighting equipment, construction, and the licensing of officers and manning, as more particularly set forth in full in this subchapter and Subchapters E (Load Lines) and F (Marine Engineering) of this chapter.

97.2 Vessels owned or employed by the United States. Steam vessels employed by the Government, unless the titles of the same are actually vested in the United States, are not exempt from inspection.

97.3 Authority of inspectors. Inspectors may lawfully inspect any vessel within their respective districts upon proper application.

97.4 Inspection of hulls. In the inspection of hulls of vessels, the inspector shall carefully inspect every accessible part of the hull, and carefully examine the wood or metal of which the hull is constructed, to determine the condition of same, making all necessary hammer tests of hulls constructed of iron or steel. If the inspector shall not have satisfactory evidence otherwise of the soundness of the hull of a wooden vessel, he shall not give a certificate until the same shall be bored or opened up to his satisfaction.

All scuppers, sanitary and other similar discharges which lead through the ship's hull, shall be fitted with efficient means for preventing the ingress of water in the event of a fracture of such pipes

The requirements of the above paragraph do not apply to the discharges in the machinery space connected with the main and auxiliary engines, pumps, etc

All scupper, soil, and sanitary pipes shall be adequately protected, casings to be substantial and so fitted to be conveniently removed for the purpose of examination

97.5 Notice to inspectors of vessel on dock, alterations Whenever any vessel is placed upon the dock for repairs it shall be the duty of the master, owner, or agent to report the same to the Officer in Charge, Marine Inspection, of that district, so that a thorough inspection may by him be made to determine what is necessary to make such vessel seaworthy if the condition or age of the vessel, in the judgment of the inspectors, renders such examination necessary

No repairs or alterations affecting the safety of the vessel, either in regard to hull or machinery, shall be made without the knowledge of the Officer in Charge, Marine Inspection. Drawings or prints of such alterations shall be furnished, in duplicate, to the Officer in Charge, Marine Inspection, having jurisdiction, one copy of which shall be forwarded to the Commandant. Notice of such repairs and changes is necessary, even if such work does not require the vessel to be placed in a drydock, and even if there are no licensed officers attached to the vessel

97.5a Gas-free certificates for repairs or alterations involving hot work. On any vessel which has carried inflammable or combustible liquids in bulk, as fuel or cargo, whether in a repair yard or elsewhere, no repairs or alterations involving riveting, welding, burning, or like fire-producing operations shall be made in or on the boundaries of oil bunkers, oil tanks, oil pipe lines and heating coils until an inspection has been made to determine that such operations can be undertaken with safety. Such inspections shall be made and evidenced as follows

(a) When in a port of the United States, this inspection shall be made by a gas chemist certificated by the American Bureau of Shipping, however, if the services of such certified gas chemist are not reasonably available, the marine inspector of the Coast Guard, upon recommendation of the vessel's owner and his contractor, or their representatives, shall select a person who, in the case of an individual vessel, shall be authorized to make the inspection. If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth that fact in writing and qualified, as may be required, shall be issued by the certified gas chemist or the authorized person before the work is started

(b) When not in such a port and a gas chemist is not available, this inspection shall be made by the senior officer present, who shall make an entry in the log to that effect

97.6 Certificates of inspection Certificates of inspection for any period less than one year shall not be issued, but nothing herein shall be construed as preventing the revocation or suspension of certificates of inspection in case such process is authorized by law

97.6a Exhibition of certificate of inspection On vessels of over 25 gross tons, the original certificate of inspection must be framed under glass and posted in a conspicuous place in the vessel where it will be most likely to be observed by passengers and others. On vessels of not over 25 gross tons, the original certificate of inspection must be kept on board to be shown on demand.

97.7 Permits to go to other ports for repairs. An Officer in Charge, Marine Inspection, issuing a permit to any vessel to proceed to other ports for repairs shall state upon the face of the same the conditions upon which it is granted and whether the vessel is to be allowed to carry freight or passengers, the quantity and number. *Provided however,* That no vessel whose certificate had expired shall be permitted to carry passengers or freight while en route to another port for repairs

When, under R. S. 4456 (46 U. S. C. 438), vessels obtain a permit from the Officer in Charge, Marine Inspection, of a district to go from his district to another to make repairs, said Officer in Charge, Marine Inspection, shall notify the Coast Guard District Commander, stating the repairs to be made on said vessels. The Coast Guard District Commander shall notify the Coast Guard District Commander of the district where such repairs are to be made, furnishing him a copy of the report of the inspectors indicating the repairs ordered on said vessels.

97.8 Furnishing of drawings of new vessels to inspectors, marking of draft on vessel
On and after July 1, 1930, the owner or builder of every new vessel of over 100 gross tons, before making application for first inspection of the vessel, shall furnish the Officer in Charge, Marine Inspection, of the district where the vessel is to be inspected, drawings or prints, as follows: Sheer, half breadth and body plans, midship section, inboard profile, arrangement of decks and hatch details, capacities of double bottoms and fuel compartments, and such other drawings or prints showing fully the general construction of the vessel (of iron, steel, or wood), including dimensions, spacing of frames, disposition of hull plates, of outside planking and inside ceiling, details of principal scarfs, construction of transverse and longitudinal bulkheads, and location of same.

The drawings or prints and description of the vessel shall be furnished in duplicate to the Officer in Charge, Marine Inspection, making the first inspection, one copy of which shall be forwarded to the Commandant.

All vessels 50 gross tons and over, under the jurisdiction of the Coast Guard, shall have the draft of the vessel plainly and legibly marked upon the stem and upon the sternpost or rudderpost or at such other place at the stern of the vessel as may be necessary for easy observance. The draft shall be taken from the bottom of the lowest part of the keel to the surface of the water, the bottom of the mark to indicate the draft in feet.

97.11 Electrical installations. On all vessels contracted for after June 30, 1928, using electricity for any purpose, the installation shall be in keeping with the best modern practice.

Wires shall be armored or run in approved metal conduits. Metal conduit or armored casing shall be required in bunkers, cargo spaces, storerooms, etc., and in all places where the leads are liable to mechanical injury. Joints in wiring shall be avoided as far as possible in the above-named spaces, and where joints are necessary they shall be made in metal boxes, readily accessible and protected in the same manner as the leads.

When wires are led through beams, frames, or nonwatertight bulkheads, they shall be carried either in metal conduits, armored casing, or protected by hard rubber, or other equivalent bushings.

When wires are carried through watertight decks or bulkheads, they shall be provided with a suitable stuffing box at deck or bulkhead. Where such points are liable to mechanical injury, they shall be protected by suitable boxes or cages.

In locating the wiring system as a whole, care shall be taken to provide accessibility for examination and repair. Special care shall be taken to avoid any arrangement which might permit the lodgment of standing water, and when necessary, openings in conduits or drains shall be installed to accomplish this purpose.

All fixtures, taps, joints, and splices shall be fitted with metal boxes. Boxes in cargo and machinery spaces, galley, and those exposed to weather shall be watertight.

Splices shall be so joined as to be both mechanically and electrically secure without solder. They shall then be soldered and properly insulated and further protected by waterproof tape.

Changes or alterations in the electrical installations of vessels now in service shall be in accordance with this rule.

Special attention shall be given by the inspectors in the examination of present installation to see that it is of such nature as to preclude any danger of fire, giving particular attention to wiring which is carried through wooden bulkheads, partitions, etc

The type of electrical equipment and the types of electric cables to be used in the various parts of vessels constructed after July 1, 1937, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A I E E Standards No 45, October 1930, as published by The American Institute of Electrical Engineers

The type of electrical equipment and the types of electric cables to be used in the various parts of all vessels constructed after January 1, 1939, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A I E E Standards No 45, December 1938, as published by The American Institute of Electrical Engineers

The type of electrical equipment and the types of electric cables to be used in the various parts of all vessels, the contract for the construction of which is signed after June 1, 1941, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A I E E Standards No 45, July 1940, as published by The American Institute of Electrical Engineers

The electrical installation on all existing vessels shall be maintained in good electrical and mechanical condition at all times. Minor replacements of cable and equipment may be made with the same type that was permitted by the regulations at the time the vessel was constructed. Major alterations or major extensions to the electrical installation on existing vessels shall be made in accordance with the rules of this section for new vessels as of the date the contract is made for such alterations or extensions

For vessels the contract for the construction of which was signed prior to September 2, 1945, the specification covering electrical installations titled "United States Coast Guard, Merchant Marine Inspection, Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945,¹ is, during the Unlimited National Emergency, applicable as alternative provisions to those contained in the foregoing parts of this section. For vessels the contract for the construction of which is signed on and after September 2, 1945, those parts of the specification covering electrical installations titled "United States Coast Guard Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945, specified in paragraphs 1, 4, and 5 thereof relating to electric cable are, during the Unlimited National Emergency, applicable as alternative provisions to those contained in the foregoing parts of this section

97.12 Whistles Inspected motor vessels shall be provided with an efficient whistle sounded by steam or by some substitute for steam to give the necessary whistle signals

97.13 Alarm bells—(a) New vessels All vessels over 100 gross tons the construction, of which is begun on and after September 1, 1943, shall have all sleeping accommodations, public spaces, and machinery spaces equipped with a sufficient number of alarm bells so located as to warn all occupants. The system shall operate from a continuous source of electric energy capable of supplying the system for a period of at least 8 hours without being dependent upon the main, auxiliary or emergency generating plants. Each bell shall produce a signal of a tone distinct from that of other bell signals in the vicinity and shall be independently fused with each of these fuses located above the bulkhead deck. The bells shall be controlled by a manually operated contact maker located in the pilot-house, or, if specific approval is given by the Commandant, in the fire control station. The characteristics of the contact maker shall be such that it possesses

(1) Positive contact.

(2) Watertightness (when located in open spaces subject to weather)

¹A copy of the specifications is on file in the office of the Federal Register, and copies may be obtained upon request from the Commandant (MMT), United States Coast Guard Headquarters, Washington 25, D C, or any Coast Guard District Commander

(3) Means whereby its electrically open or closed position can be determined by sense of touch

(4) Means to effect a make-and-break circuit for signaling

(5) Self-maintaining contacts

(b) **Existing vessels** All existing vessels over 100 gross tons and such vessels the construction of which is begun prior to September 1, 1943, shall have all sleeping accommodations equipped with a sufficient number of alarm bells so located as to warn all the occupants. The alarm bells, if electric, shall be operated from an open switch from the pilothouse or bridge. The bells shall be of such size, character, and construction, as to provide an alarm throughout the spaces for which they are provided.

97 14 Specifications covering types of voice tubes and telephones—(a) Signals

(1) Steamers using the bell signals between the pilothouse and engine room shall have a tube, of proper size, so arranged as to return the sound of the bell signals to the pilothouse, and shall also be provided with a speaking tube or other device for the purpose of conversation between pilothouse and engine room.

(2) Voice tubes or telephone equipment installed on new or existing vessels or fitted as replacements on existing vessels to provide communication between the pilothouse and (i) the emergency steering station, (ii) the steering engine room, and (iii) the engine room, shall conform to the following requirements:

(b) **Voice tubes.** (1) Where the length of voice tube required exceeds 125 feet, or if for other reasons efficient communication cannot be obtained by a voice tube installation, telephone equipment shall be substituted.

(2) Where the length of the voice tube as installed is not over 75 feet, the tube used shall be at least 2 inches in diameter. Installations having a length of over 75 feet shall be at least 2½ inches in diameter.

(3) All voice tubes and voice tube fittings shall be of noncorrodible metal, and flexible tubes or bends shall be used in place of fittings wherever possible. Joints in tubing shall be made with white lead, and tubes shall be supported at least every 8 feet on straight leads and on bends as required.

(4) Voice tubes shall be protected where liable to injury and shall not be run in bunks, cargo spaces, or through machinery spaces unless unavoidable, and they shall be amply protected by metal or heavy sheathing. They shall be provided at the lower end of all risers and in pockets where water can collect with suitable plugs for draining. Flexible terminal tubes, where used, shall have an entire metal inner surface. Voice tubes should be fitted with elliptical belled mouthpieces with hinged covers, with a whistle indicator on the side of the mouthpiece. All voice tubes shall be provided with designating name plates. Telephone equipment may in all cases be installed in lieu of voice tubes.

(c) **Telephone systems.** (1) All telephone transmitters and receivers shall be of sound-powered type designed especially for marine use. The Commandant shall approve and list equipment which, if properly installed, will meet the requirements set forth herein. The type number and model shall be plainly stamped on the equipment.

(2) A call signal shall be provided at each telephone station. This signal may be a bell or other sound device which provides a distinctive signal throughout the space where the telephone is installed. At installations which are protected by watertight boxes, all signals shall be of such character as to comply with the above when the box is closed. Ringers, if located outside the box, must be of watertight construction. Installations on new and existing vessels shall be provided with call signals which are actuated by the operation of a magneto generator at the calling station, except that sound powered replacements of battery operated telephone equipment on existing vessels may be provided with battery operated call signals. In all cases the calling circuit shall allow any one station to call any other station individually.

(3) At each telephone installation a suitable hanger for the handset shall be provided. It shall be constructed in such a way as to hold the handset firmly in place and away from the bulkhead. The handset shall not be dislodged from the hanger by the motion of the ship or by a severe shock near the mounting.

(4) Telephones installed at external locations exposed to the weather or in locations subject to severe moisture conditions shall be housed in a substantial, watertight metal inclosure. The cover shall be hinged at the bottom or side of the box and, when closed, shall be fastened by a simple substantial mechanism which, when operated, exerts sufficient pressure to make the inclosure watertight. The gasket shall be fastened to, and inserted in, the edge of the box or cover. The magneto generator and switches shall be of watertight construction. The generator and all switches shall be installed inside the inclosure.

(5) At other locations where a watertight box is not required, the telephone equipment shall be of splashproof construction and shall be so installed as to minimize possibility of damage by external means. In engine rooms a booth or other suitable auxiliary equipment shall be provided, if necessary, in order that a telephone conversation can be carried on while vessel is being navigated.

(6) The system shall be installed independent from any other systems of communication or of wiring, but may be extended to cover any other locations which are necessary or desirable. Telephone cable shall be of a type suitable for marine use and shall be run as close to the fore and aft center line of the vessel as possible, and protected from external damage. On passenger vessels where telephone cable must, due to the vessel's construction, run closer than one-fifth of the beam to the side, port and starboard cables shall be provided and connected in parallel. It shall be so installed as to minimize ingress of water and dampness.

(7) The talking circuit shall be electrically independent of the calling circuit. A short or open circuit or a ground on either side of the calling circuit shall not affect the talking circuit in any way.

(d) **Telegraph.** Nothing in this section shall be construed to prevent the use of the so-called telegraph now in use for conveying signals from the pilothouse to the engine room, but in all cases where the telegraph is used the signal shall be repeated back.

(e) **Cable traveler.** (See § 96 21 of this chapter.)

(f) **Electrical engine order telegraph systems.** All electrical engine order telegraph systems on vessels, not also equipped with mechanical telegraphs, shall be provided with an alarm, located on the bridge, to indicate visually and audibly the failure of power to the system.

(g) **Engine-room signals.** Signals between engine room and pilothouse, whether they be telegraph, bell, whistle, telephone, or voice tubes, shall be examined and tested at each inspection.

97 15 Fog bells. The efficient fog bell required upon vessels by law (sec 1, 26 Stat 325, as amended; 33 U S C 91) shall be held to mean a bell not less than 8 inches in diameter from outside to outside and constructed of bronze or brass or other material equal thereto in tone and volume of sound, and located where the sound shall be the least obstructed.

97.16 Emergency lighting system. (a) All vessels engaged in the passenger service, which are electrically lighted by dynamos or other electric units, located below the deep-load line of the vessel, shall have on board an emergency electric lighting system located above the deep-load line to light the vessel sufficiently to enable the passengers and crew to find their way to the exits in the event of failure of the main lighting system. The emergency lighting system shall at all times be ready for immediate use, and shall be installed and arranged so that all emergency lights may be switched on from the pilothouse, navigation bridge, or a central station.

(b) On all passenger vessels contracted for on and after July 1, 1935, or where existing emergency installations operated by internal combustion engines are replaced, the emergency generator shall be driven by a Diesel or semi-Diesel engine, equipped with means for quick starting. Such emergency equipment shall be located in steel or iron compartments or rooms on the deck above the weather deck and isolated from the passenger and crew quarters. Where existing installations of emergency engines and generators are located in wooden compartments or rooms, such compartments or rooms shall be made fire-resistant by lining same with asbestos board having a thickness of not less than one-quarter inch over which iron or steel sheathing shall be fitted.

97 17 Use of approved equipment. (a) No lifeboat, lifeboat-disengaging apparatus, life raft, life preserver, fire extinguisher, fire-extinguishing apparatus, or other equipment required to be approved by title 52, Revised Statutes, shall be used on any vessel inspected and certificated by the Coast Guard which shall not first be approved by the Commandant.

(b) Boilers, pressure vessels, machinery, piping, electrical and other installations, including lifesaving, fire-fighting, and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (sec 501, 56 Stat 180, 50 U S C App Sup , 635), which do not fully meet the detailed requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended. In each instance prior to final action by the Commandant, the Officer in Charge, Marine Inspection, shall notify Headquarters of the facts in the case, together with recommendations relative to suitability for retention.

97 17a Repairs to fire-fighting and lifesaving apparatus. No repairs or alterations, except in emergency, shall be made to any lifeboat, lifeboat-disengaging apparatus, life raft, life preserver, fire-extinguishing apparatus, or other appliance subject to inspection, without advance notice to the Officer in Charge, Marine Inspection. Such repairs or alterations shall so far as is practicable be made with materials and tested in the manner specified within this part for new construction. Emergency repairs or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, in the district where the vessel may call after such repairs are made, nor shall any lifeboat or life raft be reconditioned or used on a steamer other than that for which it was built, without notice to and supervision by the Officer in Charge, Marine Inspection, in the district wherein such reconditioning or repairs are to be made.

97 18 Standard in inspection of hulls, boilers, and machinery. In the inspection of hulls, boilers, and machinery of vessels, the rules promulgated by the American Bureau of Shipping respecting material and construction of hulls, boilers, and machinery, and the certificate of classification referring thereto, except where otherwise provided for by the rules and regulations in this subchapter, Subchapter E (Load Lines), or Subchapter F (Marine Engineering), shall be accepted as standard by the inspectors.

97 18a Special surveys of unclassified passenger vessels. Special surveys, applicable to the age of the vessel and corresponding to class surveys, shall be conducted by inspectors on all unclassified passenger vessels. These surveys shall in no way affect the thoroughness of the annual inspections. A notation shall be made in the lower right-hand corner of the certificate of inspection appropriate for the survey, viz

Special survey No 1	Four years from date of build	S S No 1	Place, date
Special survey No 2	Four years from the date of special survey No 1	S S No 2	Place, date
Special survey No 3	Twelve years from the date of build	S S No 3	Place, date.
Second special survey No 1	Four years from the date of special survey No 3.	Second S S No 1	Place, date
Second special survey No 2	Four years from the date of second special survey No 1	Second S S No 2	Place, date

Second special survey No 3 Twenty-four years from date of build Second S S No 3 Place, date

Third special survey No 1 This and succeeding surveys are to correspond with the second special survey No 1, etc

(a) Special surveys of hull, equipment, and motive power—(1) Special survey No. 1. This survey is to be carried out at 4 years from the date of build

(i) (a) The vessel is to be placed in drydock or upon a slipway and the keel, stem, stern frame, or stern post, and outside planking or plating are to be cleaned and afterward examined, recalked, and recoated where necessary, the rudder is to be examined and lifted when required and the gudgeons rebushed or the braces and pintles refitted as may be necessary

(b) In the case of wooden vessels careful examination is to be made of the entire structure, faulty fastenings, bolts, or treenails backed out or otherwise dealt with to the satisfaction of the inspector When in the opinion of the inspector, it is necessary, borings are to be made and should they disclose cause for further examination, listings shall be made where and as required to satisfy the inspector

(ii) The holds, 'tween decks, peaks, bilges, engine and boiler spaces, and bunkers are to be cleaned out and the surfaces of the framing and plating are to be cleaned and examined and recoated where necessary All the watertight bulkheads are to be examined, and tested if considered necessary, with a head of water.

(iii) The platform plates in the engine and boiler spaces are to be removed when required, and in the holds and bunkers one strake of ceiling at the bilges and one strake of ceiling on each side fore and aft and all portable ceiling hatches are to be lifted. All lumbers are to be cleaned free from dirt

(iv) The cement or other composition on the inner surface of the bottom plating is to be carefully examined and tested, to ascertain if it is adhering satisfactorily to the plating

(v) Where a double bottom is fitted, the tanks are to be thoroughly cleaned out and examined internally, sufficient ceiling is to be lifted or all the ceiling is to be lifted, if necessary, for cleaning and coating the top plating, and the tanks are to be tested with water pressure equal to the height of the load draft of the vessel

(vi) Where a double bottom and other tanks are used for fuel oil bunkers, the cleaning out of such tanks need not be insisted upon, provided the inspector is able to determine by an external examination that the general condition of the tanks is satisfactory Tanks in such cases may be tested with oil to the height of the overflow

(vii) Deep water ballast tanks, peak ballast tanks, and fresh water tanks which form a part of the structure of the vessel are to be cleaned out and examined internally, and are to be tested with a head of water to a height of 8 feet above the crown of the tank, or to the height of the load draft of the vessel, or to the highest point to which liquid may rise under service conditions, whichever is highest

(viii) The decks are to be examined, and wood decks are to be bored where worn and renewed if reduced to three-fourths the rule thickness, or if found otherwise defective

(ix) The masts, spars, rigging, hawse pipes and outfit are to be examined, and found or placed in good and efficient condition, and the anchors are to be examined and found or placed in good condition and their weight, type, and number noted

(x) The hatch covers and fore and afters, the tarpaulins, the hatchway and ventilator coamings, deckhouses, the engine and boiler casings and all other means of protecting openings in the weather decks are to be examined, and found or placed in good condition

(xi) All parts of the steering arrangements together with the blocks, rods, chains, or other transmission gear are to be examined, and found or placed in good condition,

(xi) The windlass, hand pumps, sluice valves, watertight doors, and air and sounding pipes are to be examined, and found or placed in good and efficient condition

(xii) When spaces are insulated in connection with refrigerating plant, the timbers and hatches are to be lifted and an examination is to be made in way of same

(xiv) The engines and boilers of all vessels will be required to undergo periodical surveys at the same time as the special surveys on the hull

(2) **Special survey No 2** This survey is to be carried out at 4 years from the date of the special survey No 1. All the requirements of special survey No 1 are to be complied with, in addition to the following requirements

(i) (a) A second strake of ceiling on each side fore and aft and all portable ceiling hatches are to be lifted in the holds and bunkers

(b) In the case of wooden vessels no planking is to be removed except, in the opinion of the inspector absolutely necessary to disclose the true condition of the vessel, or as may be found necessary, to effectively remedy the defects otherwise disclosed

(ii) Double bottom and other tanks used as fuel oil bunkers are to be thoroughly cleaned out, cleared of gas, and examined internally, and the tanks are to be tested with water pressure to the height of the overflow

(iii) The chain cables are to be ranged, the shackle pins driven out, and the cables examined, and if found reduced in sectional area at their most worn part to the extent represented by the following table, they must be renewed

Diameter of cable	Maximum reduction to be allowed
$\frac{3}{8}$ inch and under $1\frac{1}{8}$ inch.....	$\frac{1}{8}$ in
$1\frac{1}{8}$ inch and under $1\frac{3}{8}$ inches.....	$\frac{1}{8}$ in
$1\frac{3}{8}$ inches and under $1\frac{7}{8}$ inches.....	$\frac{1}{8}$ in
$1\frac{7}{8}$ inches and under 2 inches.....	$\frac{1}{8}$ in
2 inches and under $2\frac{1}{8}$ inches.....	$\frac{1}{8}$ in
$2\frac{1}{8}$ inches and under 3 inches.....	$\frac{1}{8}$ in
3 inches and under $3\frac{1}{8}$ inches.....	$\frac{1}{8}$ in

(3) **Special survey No. 3** This survey is due 12 years from the date of build and can be carried out at any time prior to the date when it becomes due, but it must be carried out within 13 years from the date of build. All the requirements of special surveys Nos. 1 and 2 are to be complied with, in addition to the following requirements

(i) (a) All the close ceilings, wood linings, and casings in the holds and bunkers, ceiling spars and platform plates in the engine and boiler spaces are to be lifted, and all rust throughout the vessel, both inside and outside, is to be removed

(b) In respect to wooden vessels, treenails in the bilges must in all cases be backed out, the center line members must be carefully searched and refastened to the satisfaction of the inspector, and where faulty the refastening bolts must be driven through and clinched over rings

(ii) When the vessel is thus prepared, the outer and inner surface of the shell plating and the whole of the framing, floors, brackets, reverse bars, keelsons, girders, tank top plating, engine and boiler seatings, shaft tunnels, thrust and shaft stools, beams, watertight bulkheads, rivets, stringers, and decks are to be examined, and found or placed in good condition

(iii) (a) If it is considered necessary by the inspector, the shell plating, deck plating, and such other parts of the vessel as are liable to excessive corrosion are to be drilled, and where a material reduction of over 25 percent in the original scantlings is found to have taken place, the defective parts are to be removed and replaced with new materials of the original scantlings and quality

(b) In the case of wooden ships, the beam ends, knees, beam end connections and all principal parts to be carefully examined and bored as may be required by the inspector, and

where necessary to ascertain the condition of the beam ends the deck plank adjacent to the lock strakes should be removed

(iv) (a) In cases where the deterioration of the scantlings is widespread, a detailed preliminary report with a sketch if possible is to be made by the inspector and forwarded immediately to Headquarters for its consideration

(b) In the case of wooden vessels, listings are to be cut inside along seam lines, without disturbing fastenings, above and below the bulge strakes, so as to expose the timbers for one-third the length of the vessel, from each end on both sides, and at such additional and intermediate openings as the inspector may require

(v) (a) When all the rust has been removed, the surfaces of the iron and steel work throughout the vessel are to be recoated, but this should not be done until after examination by the inspector

(b) In the case of wooden vessels, if considered necessary by the inspector, planking may, at his discretion, be removed on both sides of the vessel a length equal to one complete strake on one side, on both sides of the vessel under the counter, and from stem aft toward the foremast such length as the inspector may determine, but not less than eight frames. The inspector will, in his discretion, be careful not to have planking removed that has been removed on previous surveys or when the vessel's condition can be disclosed as, or made satisfactory without disturbance to the planking

(vi) (a) Where side lights are fitted, the condition of the plating in way of same is to be ascertained, and in way of cabin accommodation the lining may, in the first instance, be removed so that the inspector may judge of the condition of the hull at those parts, and if, upon such examination, he considers it necessary, additional lining must be removed

(b) In the case of wooden ships all mast and bowsprit wedging is to be removed, and the condition of the plating of iron or steel masts, bowsprits, and spars tested by hammering or drilling, as may be found necessary

(vii) When spaces are insulated in connection with refrigerating plant, the timbers and hatches are to be lifted, and enough lining is to be removed from all the spaces to enable the inspector to satisfy himself as to the general condition of the plating and framing in way of the insulation

(4) **Second special survey No. 1.** This survey is to be carried out at 4 years from the date of the special survey No. 3. All the requirements of the special survey No. 2 are to be complied with

(5) **Second special survey No. 2.** This survey is to be carried out at 4 years from the date of the second special survey No. 1. All the requirements of the special survey No. 2 are to be complied with

(6) **Second special survey No. 3.** This survey is due in 24 years from the date of build, but it must be carried out within 25 years from the date of build. All the requirements of special survey No. 3 are to be complied with in addition to the following requirement

The actual scantlings of the vessel throughout are to be ascertained by the inspector and reported by him in detail to Headquarters. The bottom plating need not be drilled if the cement on same is adhering satisfactorily. Generally, when a material reduction of 25 percent or more is found the material is to be removed

(7) **Third special survey No. 1.** This and succeeding surveys are to correspond with the second special survey No. 1 and succeeding surveys, unless otherwise determined by the Commandant

(b) **Propelling plant.** (1) At these special surveys and on other occasions when the vessel is in dry dock, the sea connections, together with the cocks and valves and strainers in connection with same, shall be examined. All iron and steel fastenings of seacocks and valves to the shell plating should be examined and renewed if necessary at each special survey No. 3

(2) The outboard shafts shall be drawn for examination at least once every 3 years

When the after bearing is worn down one-fourth inch with shafts not exceeding 9 inches in diameter, five-sixteenths inch when over 9 and not exceeding 12 inches, and three-eighths inch with shafts over 12 inches in diameter, the bearing shall be rebushed

(3) At each special survey, the cylinders or turbines, pistons, valves, pumps, condensers, thrust bearings, main and tunnel shafting, evaporators, and steam steering gear, and such other parts of the machinery as may be considered necessary shall be examined

The pumping arrangements from the several holds, as well as from the engine and boiler spaces, shall be examined

(4) At each special survey, the boilers and superheaters shall be carefully examined inside and outside, and the inspector shall satisfy himself that the boilers and all their appurtenances are in perfect order in every detail. The safety valves shall be carefully examined and set to the working pressure

(5) Internal-combustion engines A complete examination shall be made of the main and auxiliary machinery All cylinders, pistons, valves, valve gears, pumps, connecting rods and bearings, gules, cross heads, the crank, thrust, and line shafting shall be examined The cylinders, pistons, and valves of the air compressors shall be examined

The various engine piping systems, air vessels, coolers, oil tanks, and the engine auxiliaries shall be cleaned if necessary, and examined as far as practicable

Other parts of the machinery as may be considered necessary by the inspector shall be examined The spare parts should be checked

The requirements for special periodical surveys of steam engines and boiler installations apply to internal-combustion engine installations as far as applicable

(6) The Commandant may in its discretion exempt a vessel of the "Bay and Sound" class from any or all of the requirements of the special surveys applicable to such vessels when in its judgment such survey would be impracticable and unreasonable *Provided*, That any request for exemption shall be placed before the Commandant by the Officer in Charge, Marine Inspection, having jurisdiction of the vessel, together with the reasons therefor in detail

97 19 Copies of specifications and/or blueprints Sixty copies of all blueprints and/or specifications of every article approved after July 1, 1927, for use on vessels subject to inspection shall be supplied to the Commandant for the use of inspectors

97 20 Passenger accommodations for ferryboats Ferryboats subject to inspection under Title 52, Revised Statutes, permitted to carry 200 or less passengers shall have at least one toilet and one washbasin for men and one toilet and one washbasin for women located in so-called toilet rooms, in, or adjacent to, passenger quarters

Such vessels permitted to carry over 200 and not over 500 passengers shall have at least one toilet, one urinal, and one washbasin for men and two toilets and one washbasin for women

For every additional 500 passengers permitted to be carried there shall be one additional toilet or urinal for men and one additional toilet for women

Washbasins to be added in proportion to one additional for every two additional toilets or urinals in the men's room and every two additional toilets in the women's room

The above is applicable to new vessels, also to existing vessels when reasonable and practicable

97 21 Crew accommodations On all vessels of 100 gross tons and over, the contract for the construction of which is signed after January 1, 1941, there shall be provided at least one toilet, one washbasin, and one shower or bathtub, for each eight members, or portion thereof, in the crew to be accommodated The crew to be accommodated shall include all members who do not occupy rooms to which private facilities are attached

When the engine room crew, exclusive of licensed officers and others separately provided for, exceeds eight, their toilet and washroom equipment shall be separate from the other crew

members When the steward's department crew, exclusive of those separately provided for, exceeds eight, their toilet and washroom equipment shall be separate from the other crew members Separate facilities shall also be provided for the female members of the crew

All washbasins, showers, and bathtubs shall be equipped with proper plumbing, including hot and cold running water Washbasins may be located in the crew sleeping quarters, if properly installed and equipped with proper plumbing The washrooms and toilet rooms shall be equipped with proper drains

The toilet rooms shall be separate from the washrooms and at least one washbasin shall be fitted in each toilet room All toilets shall be installed with proper plumbing for flushing Where more than one toilet is located in a space or compartment, each toilet shall be separated by partitions, which shall be open at the top and bottom for ventilation and cleaning purposes Toilets shall be provided with seats of the open front type that automatically lift up when not in use Urinals may be fitted in toilet rooms, if desired, but no reduction in the required number of toilets will be made therefor

When the total number of the crew exceeds 100, consideration may be given to special arrangements and to a reduction in number of facilities required

On all vessels of 100 gross tons and over, the contracts for the construction of which were signed on or prior to January 1, 1941, the toilet and washing facilities shall be in keeping with the age, size and service of the vessel and consistent with the principles underlying the requirements for vessels the contracts for the construction of which were signed after January 1, 1941, when reasonable and practicable a minimum of one toilet, one washbasin, and one shower or bathtub for each ten members, or portion thereof, in the crew to be accommodated, shall be provided On such vessels separate washing facilities are not required where the engine room crew, exclusive of licensed officers and others separately provided for, does not exceed ten

97 22 Passenger accommodations for excursion boats and passenger barges Excursion boats and passenger barges, permitted to carry 100 or less passengers shall have at least one toilet and one washbasin for men, and one toilet and one washbasin for women, located in so-called toilet rooms, in, or adjacent to, passenger quarters

Such vessels permitted to carry over 100 and not over 300 passengers shall have at least two toilets and one washbasin for men, and two toilets and one washbasin for women Such vessels permitted to carry over 300 and not over 500 passengers shall have at least three toilets and two washbasins for men, and three toilets and two washbasins for women

For every additional 500 passengers permitted to be carried on such vessels, there shall be at least one additional toilet for men and one additional toilet for women

Washbasins to be added in proportion to one additional basin for every two additional toilets or urinals in the men's room and one additional basin for every two additional toilets in the women's room

All toilet and washing equipment shall be fitted with running water

Urinals may be substituted for toilets required in the men's department *Provided*, That at least one-half of the toilet equipment required in the men's department are toilets

Private bath and toilet equipment rented with individual rooms to passengers shall not be considered a part of the required equipment within the meaning of this rule

Vessels carrying passengers shall have separate toilets and washbasins for crew, located separately from passengers' toilet and washroom equipment space

Where passenger barges are towed alongside, the toilet and washbasin equipment required may be on the towing vessel, provided passengers may pass to and from the towing vessel with safety

The above is applicable to new vessels, also to existing vessels when reasonable and practicable

PART 98—FERRYBOATS

Sec.	Sec.
98 1 Navigation limits	98 7 Automobiles or other motor vehicles carried on ferryboats
98 2 Bulkheads	
98 3 Lifesaving equipment	CROSS REFERENCE
98 4 Life preservers and fire-fighting equipment	Definition of terms See § 94 01
98 5 Lifesaving and fire-fighting equipment of car-ferry steamers	Fire prevention, fire apparatus See part 95
98 6 Duty of master of car-ferry steamer	Passenger accommodations for ferryboats See § 97 20

Section 98.1 Navigation limits The navigation of ferryboats shall be confined to the ferry routes specified in the certificate of inspection, but such vessels may be permitted to go beyond their authorized routes with passengers only, or, without such permit, to lighten or relieve vessels in distress. When any ferryboat leaves her ferry route and carries passengers, she shall be required to carry the same officers, crew, and equipment as required of other steamers carrying passengers.

98 2 Bulkheads Every new mechanically propelled ferry vessel carrying passengers for hire shall have a sufficient number of transverse watertight bulkheads so that the vessel will remain afloat and have positive stability in the event any one main compartment is flooded.

A forepeak or collision bulkhead shall be fitted and located not less than 5 percent of the length of the ship, and not more than 10 feet plus 5 percent of the length of the ship from the bow, at load water line.

One bulkhead shall be fitted at the forward end of the machinery space (which includes boiler space) and one bulkhead shall be fitted at the aft end of the machinery space. Other transverse bulkheads shall be so located as to meet the above requirements of subdivision and stability.

Main transverse bulkheads shall not be stepped, but may be recessed. No recess shall be fitted nearer the vessel's side than one-fifth of the vessel's beam amidships measured at right angles to the center line at the level of the load water line on which the subdivision is based. Bulkheads shall extend to a deck whose distance above the load water line is sufficient to enable the subdivision and stability requirements to be met with a fair margin of safety.

If the distance between two adjacent main transverse watertight bulkheads is less than 10 feet plus 2 percent of the vessel's load water line, only one of these bulkheads shall be regarded as forming a boundary of a main compartment.

In lieu of bulkheading, the Commandant will allow alternative arrangements wherein sufficient buoyancy is supplied by independent air tanks or other means, to float the vessel when flooded while fully loaded. Such arrangements must be approved by the Commandant in each instance.

Existing mechanically propelled ferry vessels carrying passengers for hire shall comply with the above requirements for new vessels unless it can be shown by the owner to the satisfaction of the Commandant that the application of the requirements is impracticable and unreasonable. (Where the length of trip between terminals is 10 minutes or less, the last paragraph is effective January 1, 1940.)

98 3 Lifesaving equipment. All ferryboats of 50 gross tons or over shall be equipped with such lifeboats, life rafts, outside ladders, and other means of escape, in case of disaster, as, in the opinion of the inspectors, shall meet the requirements of each particular case. But

in no case shall the cubic feet of boat capacity be less than that provided in the table following

	<i>Cubic feet</i>
Ferryboats of 50 and not over 300 gross tons.....	120
Ferryboats over 300 and not over 600 gross tons.....	240
Ferryboats over 600 gross tons.....	360

Provided, That on ferryboats of more than 300 gross tons one-half the boat capacity required may be substituted by its equivalent in approved life rafts

Ferryboats of less than 50 gross tons shall be equipped with boats or rafts as in the opinion of the inspectors may be necessary in case of disaster to secure the safety of all persons on board

98 4 Life preservers and fire-fighting equipment All ferryboats shall be equipped with a life preserver for each person carried, and in addition thereto shall have a number of life preservers suitable for children equal to at least 10 percent of the total number of persons carried All life preservers shall be distributed in the most accessible places, where they can be reached at all times

All ferryboats shall be provided with the same fire apparatus required on passenger vessels of equal tonnage, except that a fire-detecting and alarm system need not be installed, but a manual sprinkler system shall be installed to blanket the vehicle spaces on all two-decked ferryboats

98 5 Lifesaving and fire-fighting equipment of car-ferry steamers All car-ferry steamers transporting passengers in cars shall carry the same lifesaving and fire-fighting equipment as required on ferryboats, excepting that the number of life preservers shall equal the number of persons carried

98.6 Duty of master of car-ferry steamer. It shall be the duty of the master of any such car-ferry steamer to see that all of the doors of the cars are unlocked and that the vestibules of the cars are open while the cars are on the steamer, to allow the persons so carried free egress at all times

98 7 Automobiles or other motor vehicles carried on ferryboats (a) Automobiles or other motor vehicles shall be stowed in such a manner as to permit both passengers and operators to get out and away from them freely in the event of fire or other disaster Where there is insufficient clearance to provide for easy egress or ingress at all times, both passengers and operators shall be directed to leave their vehicles and to occupy other spaces reserved for them during the crossing The decks, where necessary, shall be definitely marked with painted lines to indicate the vehicle runways and the aisle spaces

(b) The master shall take all necessary precautions to see that automobiles or other motor vehicles have their motors turned off when the ferryboat is under way and the motors shall not be started until the ferryboat is secured to the ferry landing

(c) The master shall have appropriate "no smoking" signs posted and shall take all necessary precautions to prevent smoking or carrying of lighted or smoldering cigars, cigarettes, etc., in deck areas assigned to automobiles or other motor vehicles

PART 99—EXCURSION STEAMERS

See

CROSS REFERENCE

- 99 1 Permits to engage in excursions
99 2 Additional life preservers required

Definition of terms See § 94 01
Fire prevention, fire apparatus See part 95
Passenger accommodations See § 97 22

Section 99 1 Permits to engage in excursions If the master, agent, or owner of any passenger or ferry steamer desires a permit to engage in excursions, the inspectors, upon the written application of such a master, agent, or owner, may issue the same, stating the number of extra passengers the boat may carry with safety, the route she may run, and the kind and extra number of lifesaving appliances with which she is provided. The permit, when used, shall be framed under glass and exposed to the view of the passengers, in connection with the certificate of inspection.

Increases in the passenger allowance of any vessel, whether specified in regular certificate or by excursion permit, may be allowed only after personal inspection of the vessel by the Officer in Charge, Marine Inspection, or by the Coast Guard District Commander if he grants the increase, who shall be satisfied that the vessel and her equipment justify the additional allowance, and of which inspection a written record shall be made and kept in the files of the office granting the allowance and a copy thereof forwarded to the office of the Commandant.

99 2 Additional life preservers required Passenger steamers making excursions on lakes, bays, or sounds shall have, in addition to their regular lifesaving equipments, a life preserver made in accordance with the rules of the Commandant, or their equivalent in other approved lifesaving appliances, for each additional passenger allowed.

PART 100—BARGES

Sec		Sec	
100 1	Lifesaving and fire-fighting equipment of open barges carrying passengers	100 5	Fire extinguishers on barges carrying passengers
100 2	Lifesaving and fire-fighting equipment of closed barges	100 6	Railing for open barges
100 3	Lifesaving and fire-fighting equipment of barges engaged in excursions	CROSS REFERENCE	
100 4	Equipment of car-carrying barges, duty of master	Definition of terms See § 94 01	
		Fire prevention, fire apparatus See part 95	
		Passenger accommodations for excursion boats See § 97 22	

Section 100 1 Lifesaving and fire-fighting equipment of open barges carrying passengers. Any open or uncovered barge carrying passengers while in tow of any steamer shall carry one life preserver or one float for every person carried, two axes, and a yawl boat or boats of a capacity in the same proportion to the number of persons carried as is required for lifeboats on steamers carrying passengers

100 2 Lifesaving and fire-fighting equipment of closed barges. Covered barges or barges with inclosed deck or decks shall carry the same equipment as required by §100 1, except that they shall carry three axes

100 3 Lifesaving and fire-fighting equipment of barges engaged in excursions Every barge carrying passengers in tow of any steamer and engaged in excursions shall be supplied with one life preserver or one float for every person carried on board, and shall be equipped with three axes, and two yawl boats of not less than 60 cubic feet capacity each, to be carried on deck ready to be launched for immediate use, or towed in such manner as to best afford prompt relief in case of accident or disaster

100.4 Equipment of car-carrying barges, duty of master. Any barge in tow of a steamer and used for transporting passengers in cars shall be equipped in accordance with this part, and the master or person in charge of the barge or the master of the towing steamer shall see that all of the doors of the cars are unlocked and that the vestibules of the cars are open while the cars are on the barge, to allow the persons so carried free egress at all times

100 5 Fire extinguishers on barges carrying passengers. Every barge carrying passengers while in tow of a steamer shall be equipped with portable fire extinguishers in the same manner as required for passenger steam vessels of the same type and length

100 6 Railing for open barges All open barges carrying passengers shall be inclosed by a good and substantial rail not less than 3 feet high.

PART 101—DUTIES OF INSPECTORS

Sec		Sec	
101 1	Publication of inspectors' reports	101 10	Reports of accidents
101 2	Reports of Coast Guard District Commanders and Officers in Charge, Marine Inspection	101 12	Carrying of excess steam
101 3	Requests for testimony	101 14	Guards and rails
101 4	Inspection of boilers	101 15	Inclining tests
101 5	Inspection of steam pipes	101 16	Inspection of airports and deadlights
101 6	Entrance of boilers by inspectors	101 17	Inspection of lifeboat-disengaging apparatus
101 7	Location of whistles on floating structures	101 21	Fire-prevention inspection
101 8	Location of steam whistles	101 22	Inspection of quarters
101 9	Testing of boilers and hose		

CROSS REFERENCE

Definition of terms See § 94 01

Section 101 1 Publication of inspectors' reports. Annual reports shall not be made public until after they have been printed and made public by the Coast Guard. No inspector or clerk shall make public any report without the consent of the Coast Guard District Commander or the Commandant of the Coast Guard.

101 2 Reports of Coast Guard District Commanders and Officers in Charge, Marine Inspection. (a) It shall be the duty of the Coast Guard District Commanders to inform in writing their respective Officers in Charge, Marine Inspection, of their decisions in cases of appeals.

(b) A Coast Guard District Commander who grants a license to a vessel engaged in towing to carry persons in addition to its crew, under the Act approved February 23, 1901 (31 Stat L 800, 46 U S C 458, 459), shall notify the Officer in Charge, Marine Inspection, in whose jurisdiction the vessel is to operate, who shall keep a record of the same.

(c) The Officer in Charge, Marine Inspection, shall notify, through his Coast Guard District Commander, the Officers in Charge, Marine Inspection, of adjoining districts of all revocations or suspension of licenses, the names of all persons from whom licenses have been withheld, the names of all steam vessels neglecting or refusing to make repairs when ordered, and the names of all vessels that have been refused certificates of inspections with the reasons therefor.

101 3 Requests for testimony. Whenever any inspector shall find it necessary, in conducting his investigations or in the performance of any of his duties, to obtain testimony from the inspectors of other districts, he shall request the same through the Coast Guard District Commander.

101.4 Inspection of boilers. Inspectors, at their annual inspections of steam boilers, may cause to be removed from the surface of such boilers as are covered so much of said covering as may be necessary to enable them to examine parts of the boilers which cannot be properly examined from the inside, and shall examine in a thorough and careful manner, when practicable, either externally or internally, all parts of the shell of every boiler, and the masters, engineers, and owners of every steam vessel shall afford every facility necessary to carry out in the most effective and efficient manner the provisions of this section, and in no case shall an intermediate inspection be deemed any part of the regular annual inspection.

101 5 Inspection of steam pipes. It shall be the duty of inspectors when inspecting or reinspectng a vessel to carefully examine all steam pipes passing through woodwork, and if in their judgment the same are deemed unsafe they shall have them provided with air space and fitted with metal collars.

1016 Entrance of boilers by inspectors. It shall be the duty of the inspector who inspects the boilers of any steamer to actually enter the boiler or boilers where it is possible to do so, and to thoroughly examine the interior of all such boilers to see that the braces are in place and of proper size, and to determine whether the boilers are in good condition, before granting a certificate of inspection, such examinations to be made after the hydrostatic pressure has been applied. A record shall be made in the inspector's report of inspection showing whether or not the inspector did actually enter the boiler, and if he did not enter the boiler, he shall give his reasons for not entering it.

1017 Location of whistles on floating structures. It shall also be the duty of the inspectors to compel all floating structures, such as steam elevators (propelled by their own motive power), to have their whistles located on the front side of such superstructures having an elevation higher than the pilothouse of the vessel.

1018 Location of steam whistles. All steam whistles shall be placed not less than 6 feet above the top of the pilothouse of steam vessels where the height of the smokestack will admit the attachment of same below its top, when not hinged for passing under bridges, except upon steamers navigating the Red River of the North, Yukon and similar rivers, and rivers whose waters flow into the Gulf of Mexico, and steamers of less than 100 gross tons, whose steam whistles shall be placed not less than 2 feet above the tops of their pilot-houses, and all double-end ferry steamers, and steamers similarly constructed, shall have a steam whistle both fore and aft of the smokestack, or one steam whistle on either the starboard or port side of the smokestack, so that the steam, when whistle is blown, can be seen from either end of steamers, and it shall be the duty of inspectors to enforce this section at the annual inspection.

1019 Testing of boilers and hose. It shall be the duty of the inspectors to be present when the boiler is being tested by hydrostatic pressure and the inspectors shall observe and note the indication upon the gage.

It shall also be the duty of the inspectors to examine all pumps, hose, and other fire apparatus and to see that the hose is subjected to a pressure of 100 pounds to the square inch, and that the hose couplings are securely fastened in accordance with Part 95 of this chapter.

10110 Reports of accidents. Officers in Charge, Marine Inspection, shall report forthwith to their Coast Guard District Commanders in detail all accidents of a serious character—such as collisions, founderings, sinkings, fires—and all other casualties of interest to or affecting the Coast Guard in their respective districts.

10112 Carrying of excess steam. When it is known or comes to the knowledge of the Officer in Charge, Marine Inspection, that any steam vessel is or has been carrying an excess of steam beyond that which is allowed by her certificate of inspection, the Officer in Charge, Marine Inspection, in whose district said steamer is being navigated, in addition to reporting the fact to the United States district attorney for prosecution under R. S. 4437 (46 U. S. C. 413), shall require the owner or owners of said steamer to place on the boiler of said steamer a lock-up safety valve that will prevent the carrying of an excess of steam and shall be under the control of said Officer in Charge, Marine Inspection.

On the placing of a lock-up safety valve upon any boiler, it shall be the duty of the engineer in charge of same to blow or cause the said valve to blow off steam at least once in each watch of 6 hours or less, to determine whether the valve is in working order, and it shall be the duty of the master of such vessel to see that this section is observed, and it shall be the duty of the master and engineer to report to the Officer in Charge, Marine Inspection, any failure of such valve to operate.

In case no such report is made and a safety valve is found that has been tampered with or out of order, the engineer in charge of such boiler and the master of such vessel shall be

proceeded against in accordance with the provisions of R S 4490, as amended (46 U S C 239), looking to a suspension or revocation of their licenses¹

It shall be the duty of the Officer in Charge, Marine Inspection, to send a copy of this section to every steamer in his district when said copies are furnished by Headquarters

101.14 Guards and rails. (a) It shall be the duty of the inspectors when inspecting or reinspecting a vessel to see that all exposed and dangerous places, such as gears and machinery, are properly protected with covers, guards, or rails, in order that the danger of accidents may be minimized, and on vessels equipped with radio (wireless) the lead-ins shall be efficiently incased or insulated to insure the protection of persons from accidental shock. Such lead-ins shall be located so as not to interfere with the launching of lifeboats and life rafts

(b) Effective, for new construction outboard rails on passenger decks shall be in at least three courses, including the top, and shall be at least 42 inches high. Inboard rails on passenger decks and all rails on crew decks shall be in at least two courses, including the top, and shall be at least 36 inches high

101.15 Inclining tests. When inspectors have any reason to question the stability of any vessel under their jurisdiction, they shall require the owners of the vessel to make inclining tests on such vessel, under the supervision of the Commandant

Every passenger or ferry vessel of 500 gross tons or over, propelled by machinery, and every passenger or ferry vessel intended to carry 50 or more passengers, in either case when making application for first inspection to carry passengers, shall be subjected to an inclining test conducted under the supervision of the Commandant, and the results of the test shall be approved before the vessel shall be certificated

The owner or builder of every vessel described in the second paragraph of this section shall, as soon as possible, furnish the Officer in Charge, Marine Inspection, of the district where the vessel is to be inspected drawings or blueprints, as follows: Shear, half breadth and body plans, midship section, inboard profile, floors, framing, bulkheads, arrangement of decks and quarters, general arrangement and location of boilers and machinery, plan and elevation, plan and elevation sections through holds, tanks, bunkers, double bottoms and compartments, capacity plan of the bunkers, tanks, holds, double bottoms, and compartments, and the following curves: Displacement, vertical center of buoyancy, transverse metacenter, longitudinal center of buoyancy, longitudinal metacenter, center of gravity of water planes from either perpendicular, moment to alter trim, and tons per inch, except for double-end ferryboats, then the drawings or blueprints of curves will only be required to show the displacement, vertical center of buoyancy, transverse metacenter, and tons per inch. The drawings and blueprints required by this paragraph shall be forwarded, upon receipt of same, by the Officer in Charge, Marine Inspection, to the Commandant

Where vessels are required to carry fixed ballast, in order to increase the metacentric height, such ballast shall not be moved except for examination and repair of vessel, and then only in the presence of an inspector

The Officer in Charge, Marine Inspection, shall place a notation in regard to the inclining data on the upper right-hand corner of the certificate of inspection of every vessel subject to this section, to read as follows: Data relating to the stability of this vessel is on file at Coast Guard Headquarters, Washington, D C

It shall also be the duty of the Officer in Charge, Marine Inspection, to furnish the master and owner of every vessel under the jurisdiction of the Coast Guard and upon which the question of stability has been determined by Headquarters, a copy of the letter from Headquarters giving the result of the inclining test or investigation of the stability of the vessel

¹ Attention is called to R S 4437 (46 U S C 413), which makes the obstructing of a safety valve a misdemeanor subject to a \$200 fine and imprisonment for not to exceed five years

The Officer in Charge, Marine Inspection, shall require the master of every such vessel to frame this letter under glass and post it in the pilothouse

101.16 Inspection of airports and deadlights It shall be the duty of the inspectors when inspecting or reinspecting vessels to carefully examine all airports and deadlights in the hull, and to satisfy themselves that the same are safe

101.17 Inspection of lifeboat-disengaging apparatus It shall be the duty of the inspectors when inspecting or reinspecting vessels to carefully examine the lifeboat-disengaging apparatus and the blocks and falls thereof and to satisfy themselves that the same are in good condition, and, further, that they shall indicate in Form 840-A at annual inspection the name and record of all lifeboat-disengaging apparatus found, and, if unable to identify such lifeboat-disengaging apparatus by name, they shall within a reasonable time take the matter up with the Coast Guard District Commander of the district in order that such apparatus may be traced for identification and approval record

101.21 Fire-prevention inspection (a) When inspecting oil-burning vessels, either internal-combustion type or steam-driven type, the inspector shall examine the tank tops and bilges in the fireroom and engine room to see that there is no accumulation of oil which might create a fire hazard

(b) The examination of the fire-fighting equipment shall be made by inspectors This applies to fire pumps, hose, chemical fire extinguishers axes, and steam or gas smothering lines to cargo holds and compartments

(c) The inspectors shall examine the fire-fighting equipment provided for the fireroom and engine room to ascertain if it conforms to the regulations in this subchapter and that it is in good condition for immediate use

(d) At the annual inspection or periodical reinspections, the inspectors shall examine the water-sprinkling system, when fitted, to ascertain if it is in good condition and ready for immediate use

101.22 Inspection of quarters. It shall be the duty of the inspector to examine passengers' and crews' quarters to see that they are kept in a sanitary condition and to report any deficiencies

PART 102—BAY, SOUND AND LAKE STEAM YACHTS

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102 2	Air tanks	102 9	Fire apparatus
102 3	Carrying capacity of lifeboats	102 10	Axes and fire extinguishers
102 4	Davits or cranes	102 11	Life buoys
102 5	Marking of lifeboats	102 12	Inspection
102 6	Drawings, specifications, name plate		CROSS REFERENCE
102 7	Inspection of lifeboats when built		Definition of terms See § 94 01

Section 102 1 Lifeboat and life raft capacity Steam yachts shall only be required to have the same lifeboat and life raft capacity as passenger steam vessels

102 2 Air tanks Only the metal lifeboats shall be required to be provided with air tanks

102 3 Carrying capacity of lifeboats. The carrying capacity of lifeboats on steam yachts shall be computed as provided in § 94 20 of this chapter

102 4 Davits or cranes Lifeboats shall, when practicable, be carried under substantial davits or cranes

102.5 Marking of lifeboats Each lifeboat shall be provided with a suitable name board, or the name of the vessel shall be marked on the bow or stern of the lifeboat

102 6 Drawings, specifications, name plate. All lifeboats shall be substantially constructed in accordance with drawings or blueprints, and specifications approved by the Commandant

Builders of lifeboats shall affix a plate or other device to each lifeboat, having thereon the builder's name, number of boat, date of construction of boat, cubical contents of boat, and number of persons said boat will carry, as determined by the rules of the Commandant

102 7 Inspection of lifeboats when built. Coast Guard District Commanders of districts where lifeboats are built shall detail an inspector to any place where lifeboats are being built, whose duty it shall be to carefully inspect and examine the construction of such lifeboats, and he shall satisfy himself that such lifeboats are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders. When the inspector approves the construction of the boat he shall stamp his initials, together with letters "U S C G" on a blank space on the plate required to be affixed to the boat by the builder. The initials of the inspector shall be satisfactory evidence to all parties interested that the boat has been constructed in accordance with the drawings, or blueprints, and specifications on file

102 8 Life preservers These vessels shall be equipped with an approved life preserver for each person on board

102 9 Fire apparatus Pleasure steamers shall be provided with at least one double-acting steam fire pump

Fire mains shall be led from the pumps to all decks with a sufficient number of outlets arranged so that all parts of the vessel may be reached with water.

Suitable hose with nozzles and spanners shall be provided, but it shall not be necessary that the hose be coupled to hydrants, but shall be convenient to the hydrants in case of fire

102 10 Axes and fire extinguishers. Axes and fire extinguishers shall be provided in accordance with the tables in Part 95 of this subchapter

102 11 Life buoys. Steam yachts shall be equipped with ring buoys with attached self-igniting water lights as provided for passenger steamers of corresponding length

102 12 Inspection. The inspection of hulls, boilers, and appurtenances thereto shall be strictly in compliance with the United States Revised Statutes and the rules and regulations in this chapter

COAST GUARD DISTRICT COMMANDERS AND MERCHANT MARINE ACTIVITIES

District	Title	City	State	Address
1st -	Commander 1st Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection - do - do	Boston - do - do - Portland Providence	Massachusetts - do - do - Maine - Rhode Island -	1400 Customhouse 1300 Customhouse 447 Commercial St 76 Pearl St 409 Federal Bldg
2d	Commander 2d Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do do do	St. Louis do do Calo Dubuque Cincinnati Louisville Memphis Nashville Pittsburgh Point Pleasant	Missouri - do - do - Illinois - Iowa - Ohio - Kentucky - Tennessee - do - Pennsylvania - West Virginia -	232 Old Customhouse 210 Old Customhouse 216 Old Customhouse 425-427 New Post Office Bldg 301 Post Office and Courthouse 748 Federal Bldg 606 Federal Bldg 322 Customhouse 1018 Stahlman Bldg 1215 Park Bldg Post Office Bldg
3d -	Commander, 3d Coast Guard District Marine Inspection Officer Officer in Charge Marine Inspection do do do do	New York do do New London Albany Philadelphia	New York do do Connecticut New York Pennsylvania	42 Broadway Do Do 802 Post Office Bldg 813 Federal Bldg 801 Customhouse, 2d and Chestnut Sts
5th	Commander, 5th Coast Guard District Marine Inspection Officer Officer in Charge Marine Inspection do	Norfolk do do Baltimore	Virginia do do Maryland	Box 540, New Post Office Bldg Do 204 Customhouse 209 Chamber of Commerce Bldg
7th -	Commander, 7th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do	Miami do do Tampa Charleston Savannah Jacksonville San Juan	Florida - do - do - do - South Carolina - Georgia - Florida - Puerto Rico -	Box 378 Coconut Grove Station 500 Professional Bldg 501 Professional Bldg 406 Federal Bldg 82 Customhouse 205 Customhouse 210 Federal Bldg Federal Bldg
8th	Commander, 8th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do do do do do	New Orleans do do Mobile Port Arthur Galveston Corpus Christi Houston	Louisiana - do - do - Alabama - Texas - do - do - do -	P O Box 282 Customhouse 313 Customhouse 311 Customhouse Federal Bldg 410 Bluestein Bldg 232 Customhouse 919 Jones Bldg 310 Appraisers Store Bldg
9th	Commander 9th Coast Guard District Marine Inspection Officer Officer in Charge Marine Inspection do do do do do do do do do do	Cleveland do do Buffalo Oswego Detroit Duluth Toledo Saint Ignace Chicago Ludington Milwaukee	Ohio - do - do - New York - do - Michigan - Minnesota - Ohio - Michigan - Illinois - Michigan - Wisconsin -	1700 Keith Bldg Do 1600 Keith Bldg 440 Federal Bldg 205 Federal Bldg 430 Federal Bldg 311 Federal Bldg 402 Courthouse and Customhouse Municipal Bldg Customhouse, 610 Canal St National Bank Bldg 533 Federal Bldg
11th --	Commander, 11th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection	Long Beach do do	California do do	705 Times Bldg 1105 Times Bldg 1119 Times Bldg
12th -	Commander, 12th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection	San Francisco do do	California do do	613 U S Appraisers Bldg 907 U S Appraisers Bldg 227 U S Appraisers Bldg
13th	Commander, 13th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection do do	Seattle do do Portland Ketchikan	Washington - do - do - Oregon - Alaska -	New World Life Bldg Do Do 1005 Falling Bldg Federal Bldg
14th----	Commander, 14th Coast Guard District Marine Inspection Officer Officer in Charge, Marine Inspection	Honolulu do do	Territory of Hawaii do - do -	210 Federal Bldg Do P O Box 4010, Federal Bldg.

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